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... THE IRON AGE ...

JANUARY 30, 1936

ESTABLISHED 1855 Vol. 137, No. 5

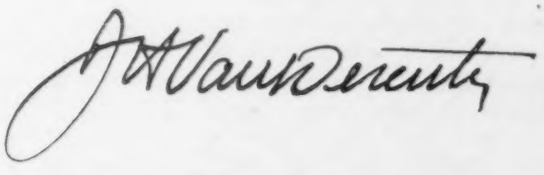
Webster Had a Word For It

THE able president of **Armco,** Charles R. Hook, is a student of American history as well as a steel maker. In speaking before the Industrial Safety Council of Detroit last week on "The American Economic System," he called attention to a speech delivered by Daniel Webster to the United States Senate in 1838.

Daniel Webster did not compile the dictionary, but he was a master in using what the dictionary contained as tools to express his beliefs. Here are the words that he put together almost 100 years ago:

> "There are persons who constantly clamor. They complain of oppression, speculation and the pernicious influence of accumulated wealth. They cry out loudly against all banks and corporations, and all means by which small capitalists become united in order to produce important and beneficial results. They carry on mad hostility against all established institutions. They would choke the fountain of industry and dry all streams.
>
> "In a country of unbounded liberty, they clamor against oppression. In a country of perfect equality they would move heaven and earth against privilege and monopoly. In a country where property is more evenly divided than anywhere else, they rend the air shouting agrarian doctrines. In a country where wages of labor are high beyond parallel, they would teach the laborer he is but an oppressed slave.
>
> **"Sir, what can such men want? What do they mean? They can want nothing, sir, but to enjoy the fruits of other men's labor. They can mean nothing but disturbance and disorder, the diffusion of corrupt principles and the destruction of the moral sentiments and moral habits of society."**

These words are well worth reading today. They tell us that self-seeking economic messiahs with patented economic remedies and demagogues who deal from the bottom of the pack are not new. Our great-grandfathers knew them and our great-grandchildren will. We have survived and will survive by seeing through them.



The Welding Of Alloy Steels—I

By DR. J. C. HODGE
Babcock & Wilcox Co., Barberton, Ohio

WITH the almost limitless number of combinations of alloying elements which may be used in the alloying of steel, and with the present large number of various commercial alloy steels, any general discussion of the welding of such steels must be based on a method of classifying them. The classification may be made by a number of methods:

1.—Chemically by designation of the alloying element or elements such as nickel steel, chromium steel, manganese-vanadium steel, chromium-manganese-silicon steel, etc. Each of these may in turn be further classified based on the amount of alloying element present; for example, 4 to 6 per cent chromium, 12 to 14 per cent chromium, 16 to 18 per cent chromium, etc. The S.A.E. steel specifications represent an excellent example of this type of classification.

2.—By designation of intended use, such as tool steel, machinery steel, automotive steel, corrosion resistant steel, structural steel, etc.

3.—Metallographically by designation of the state of

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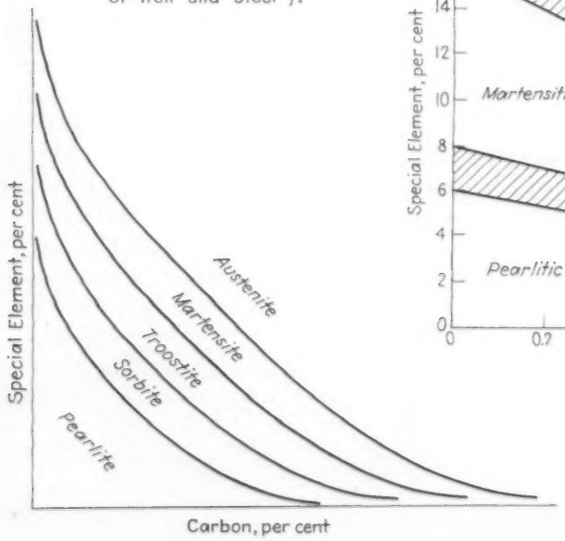
FIG. 1.—Guillet's constitutional diagram for alloy steels (from Sauveur's "Metallography and Heat Treatment of Iron and Steel").



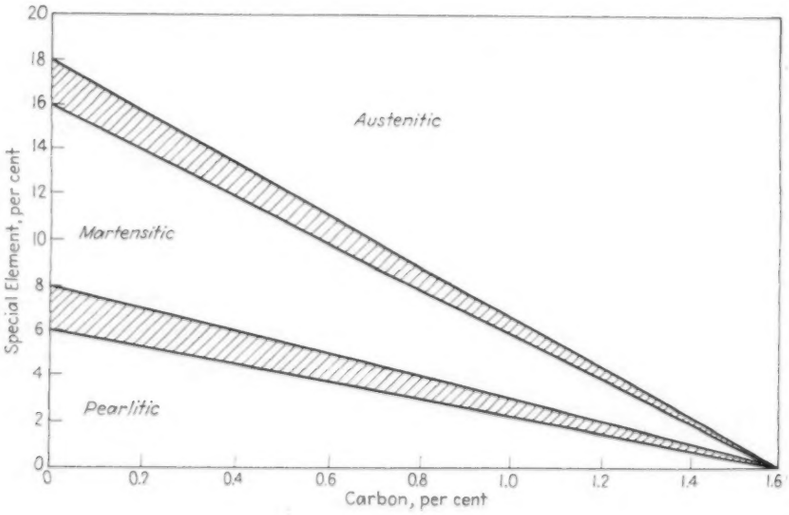


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FIG 2.—Constitutional diagram for alloy steels in general, modified by Sauveur.

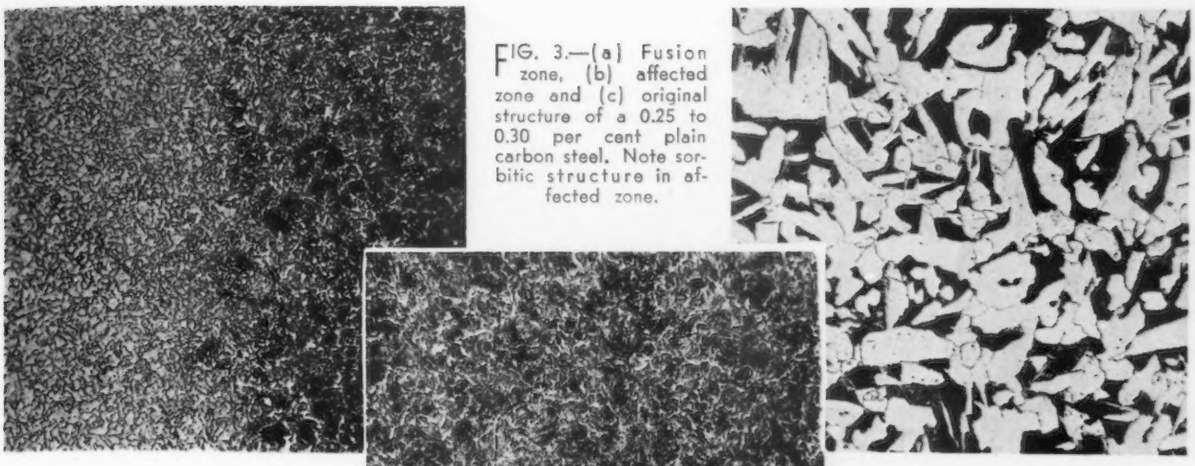

FIG. 3.—(a) Fusion zone, (b) affected zone and (c) original structure of a 0.25 to 0.30 per cent plain carbon steel. Note sorbitic structure in affected zone.

the carbide constituent in the alloy steel, i.e., pearlitic, sorbitic, martensitic, etc.

4.—By designation of the critical rate of cooling for hardening, such as water hardening, oil hardening, air hardening, etc.

All of the fusion welding processes involve the deposition of molten metal on or between the parts to be joined, the molten metal being rapidly cooled by reason of absorption of the heat of the relatively small amount of weld metal by the surrounding larger mass of colder parent or base metal. The welding processes also involve the heating of the parent metal to varying temperatures, producing a thermal gradient from the melting temperature at the line of fusion to the normal temperature of the parent metal at some distance from the joint. This thermal gradient will change depending on whether or not a preheating of the parts being welded has been resorted to, the preheating temperature, the thermal capacity of the parent metal, and the heat input of the welding process used. In multiple-bead or weld layer deposition where more than one pass of the welding element is required to fill in the joint, the weld metal and parent metal may be subjected to repeated heating and cooling. For these reasons a discussion of the welding of alloy steels must involve a discussion of the metallurgical changes resulting in heating them to various temperatures up to the melting point and in subsequently cooling at various rates from these temperatures.

These effects may be best described in a very general and elemental way by considering the alloy steels under the last two classifications presented earlier in the discussion.

General Metallurgical Considerations

Fig. 1 shows Guillet's classical constitutional diagram for alloy steels in general. Arbitrary percentages of carbon and of the special element have been, of course, selected. The diagram does not cover all types of alloy steels but is sufficient for our general discussion. (For a more complete discussion any standard textbook, such as Sauveur's "Metallography and Heat Treatment of Iron and Steel," may be referred to.) The diagram shows the structural constituent characterizing a steel of known alloy and carbon contents slowly cooled from a high temperature, and by it we may predict the general properties of any given steel, its general behavior on heat treatment, and in a somewhat indirect manner the general hardening propensity of the steel on cooling from welding temperatures.

For a given carbon content, increasing the alloy content causes the steel at normal temperature to exist in the pearlitic, martensitic and austenitic condition in succession.

For a given alloy content, increasing the carbon content results in conversion from pearlitic to martensitic to austenitic condition in succession at normal temperatures.

The commercial plain carbon steels considered weldable under usual welding technique, i.e., 0.35 or 0.40 maximum carbon and with alloying element approximating ¾ of 1 per cent maximum, occupy an externally small corner of the pearlitic zone of the diagram.

The commercial low alloy structural steels with carbon up to 0.35 per cent maximum and special alloying elements up to 3.50 per cent, also occupy a small corner of the pearlitic zone of the diagram.

The balance of the field covers special alloy steels, commercial austenitic steels being best represented by high nickel-chromium stainless steels, as, for example, 18 per cent chromium-8 per cent nickel; or by Hadfield's manga-

BASIC metallurgical principles governing the welding of both low alloy structural steels and of the stainless steels and irons are set forth in this paper, one of the outstanding contributions to the fall (1935) meeting of the American Welding Society. The low alloy materials are covered in this part of Doctor Hodge's paper; the part devoted to the welding of stainless steels and irons will be included in an early issue.

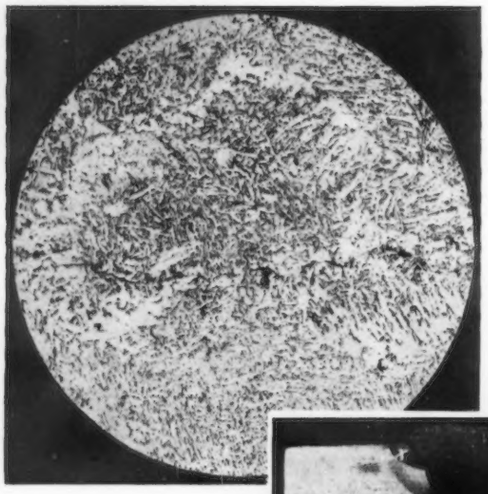

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FIG. 4.—Crack in martensitic weld metal (3.5 per cent Ni, 0.20 per cent C) BHN 350.

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FIG. 5.—Macrostructure of welded joint in 2-in. thick, SAE 3340 plate.

o o o

nese steel of 12 per cent manganese and 1 per cent carbon.

Strictly speaking, the diagonal lines between the various types of structure should not intersect the axes of the diagram but should be asymtotic to these axes as shown in Fig. 2. Additional zones showing the sorbitic and troostitic transition structures between martensite and pearlite have been introduced.

As previously stated, however, the two diagrams shown are for alloy steels after slow cooling from above the critical temperature. The effect of rapid cooling such as is encountered with normal welding technique is to depress the lines of demarcation of the various structural zones toward the lower left-hand corner of the diagram. This effect is further enhanced by the extremely high temperature from which the weld metal cools. The effect of $T^{max.}$ on the hardness of an alloy steel air cooled from successively higher temperatures may be illustrated by the data on 4 to 6 per cent chromium-molybdenum steel given on page 81.

By reason of the relatively fast cooling from a very high temperature, a pearlitic steel will, on welding, show a sorbitic structure or a martensitic structure in the weld metal or heat affected zone. Even a 0.25 to 0.30 per cent plain carbon steel will be sorbitic in the affected zone (Fig. 3). A 3.50 per cent nickel, 0.20 per cent carbon steel normally considered pearlitic, i.e., on slow furnace cooling, will possess a martensitic weld metal hard and brittle and liable to crack unless preheating is resorted to (Fig. 4). Similarly a steel corresponding to S.A.E.-3330 in analysis (3.50 per cent nickel, 1.50 per cent chromium, 0.30 per cent carbon) will in the heat affected zone possess Brinell values as high as 450. Fig. 5 shows a macrosection of a weld on 2-in. thick plate of this alloy steel. The Brinell hardness value of the affected zone will vary depending upon the location since this is a multiple bead weld and the lower portions of the affected zone have been subjected to repeated heating and cooling from tempering of varying degree. For example, the hardness of the affected zone near the center of the plate thickness is 260 Brinell, while the hardness of the affected zone at the top of the joint (adjacent to last bead deposited) is 450. The hard martensitic structure of this topmost portion of the affected zone is shown in Fig. 6. The hardness of the weld metal will, of course, vary with the analysis of the electrode used.

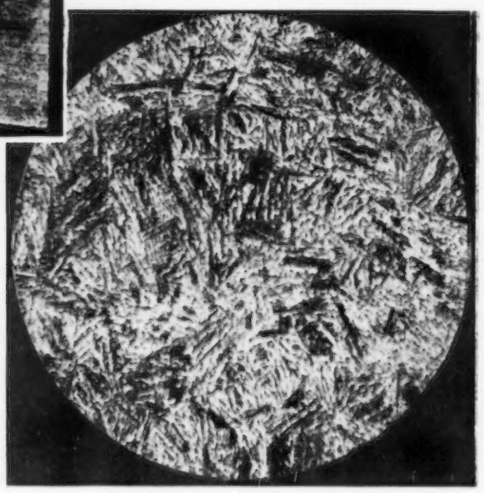

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FIG. 6.—Martensitic structure of affected zone at top of joint (Fig. 5) adjacent to the last weld bead deposited. BHN 450.

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Weldability of Austenitic and Other Steels

The austenitic steels are characterized by great ductility and toughness, the martensitic and troostitic steels by hardness and brittleness, and the sorbitic and pearlitic steels by a desirable combination of strength, toughness and ductility. The austenitic steels are, therefore, considered to be readily weldable since toughness permits resistance to welding stresses without fracture. Steels which remain pearlitic or sorbitic in the heat affected zone, i.e., pearlitic steels which do not weld harden, may be readily welded. Steels which become martensitic in the heat affected zone are weldable only with difficulty since their hardness does not permit deformation without fracture under welding stresses. Such steels require preheating for prevention of

cracks and annealing immediately after welding to transform the hard structure to more ductile sorbite or pearlite. Theoretically, it is possible to fusion weld any martensitic alloy steel which can be cast and hot worked provided preheating is employed and corrective heat treatment subsequently applied to the welded structure. In practice, however, this procedure becomes impossible in many cases by reason of the magnitude of the structure to be welded.

The necessity for heat treatment after welding will vary depending upon the alloy steel being welded and the service to which the welded structure will be subjected. For low alloy structural steels where weld hardening is no greater than in mild plain carbon steel, rules governing the stress relieving of the plain carbon steel will suffice. When the air or weld hardening becomes more marked, the necessity for stress relieving becomes proportionately greater. For the higher alloy steels such as the chromium stainless steels and irons heat treatment usually becomes mandatory, either to eliminate excessive weld hardening as in the 4 to 6 per cent chromium steel or to eliminate a condition which might result in service failure by corrosion such as carbide precipitation in the heat affected zone of nickel-chromium austenites.

Low Alloy Structural Steels

The use of alloy structural steel, i.e., steel in the form of plates and structural shapes used in bridge building, freight car, ship building, and pressure vessel construction, and for the frames and bed plates of machine tools and engines, has been limited in the past to a comparatively small tonnage. As contrasted with the relatively small parts entering into the construction of an automobile, large structural pieces such as bridge members or finished fabricated units such as large pressure vessels can not be subjected to a quenching and drawing operation to develop the optimum properties of alloy steel. In such large sections or structures increased strength and ductility is solely dependent upon the presence of the alloying elements without the more important benefit of heat treatment. The best that can be done is to use alloy structural steel in the normalized (air cooled condition), resulting in tensile strengths of 65,000 to 100,000 lb. per sq. in. as compared with 125,000 to 150,000 lb. per sq. in. or higher tensile strength for heat treated alloy steel. Indeed, it is extremely doubtful whether the structural designer could use an extremely high tensile strength steel even if it could be made available by heat treatment, since there is obviously a limit to which he can go in lightening a structure, and the use of an extremely high strength alloy steel with its accompanying lower ductility and toughness is doubtful practice in the design of large structural members.

Commercial Low Alloy High Tensile Steels

Without attempting to tabulate the chemical analyses of the various low alloy high tensile steels, the following enumeration of different commercial steels of this classification recently produced commercially is of interest: 2 to 3.5 per cent nickel steel, 1 to 1.5 per cent manganese steel, 0.20 to 1 per cent silicon steel, copper bearing steel, carbon-molybdenum steel, and the more complex steels such as chromium-manganese-sili-

(CONTINUED ON PAGE 81)

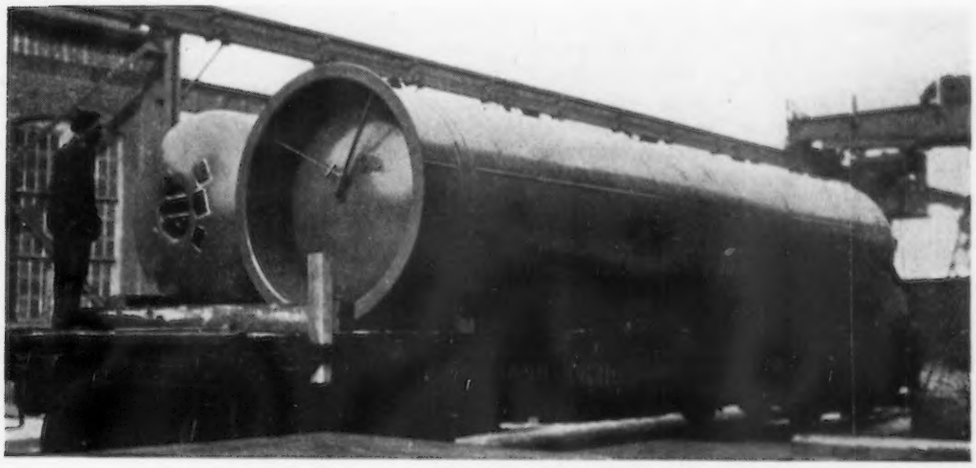

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FIG. 7.—Pressure vessels of high-tensile strength plate (70,000 lb. per sq. in. minimum) of modified carbon steel analysis.

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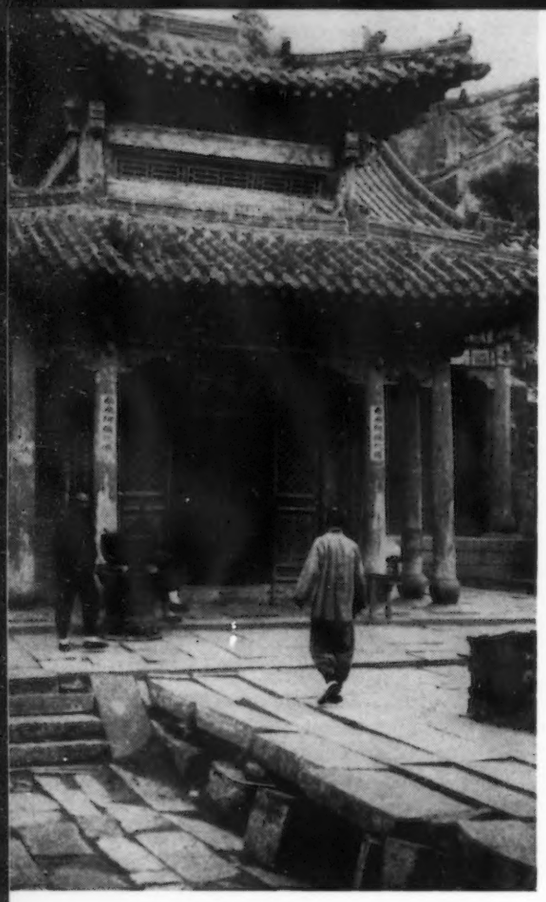
FIG. 8.—This high-speed train engine bed plate is of welded Cromansil plate, 1/4 to 3/8-in. thick.



CAST iron roof, at least 500 years old, on the Chinese shrine "Old Lady of the Mountain."

Cast Iron—It Dates Back to 300 B.C.

o o o

By RALPH M. SHAW, JR.
Publicity Manager, United States Pipe & Foundry Co.

o o o

THE metallurgy of iron and steel has generally been believed to be strictly European in origin. However, recent research and accompanying findings indicate that its real development was brought about by the ancient Chinese. Although much of the Chinese history must be surmised, it is apparent that the history of the metallurgy of iron has a highly interesting and illuminating background, closely paralleling the history and advancement of modern civilization.

The available information regarding the art in the early centuries is obscure and fragmentary, as to be expected with the limited scientific progress of those days. Certain facts have been established, however, which rather accurately determine the discovery and progress of some of the important phases of metallurgical evolution and development. Among these are the disclosures pertaining to the actual development of cast iron a number of centuries ago.

The origin of cast iron hitherto has been generally accredited to Germany, in or around the year 1400 A.D., and to have been taken up and followed soon after by enterprising leaders in Spain. A recent excavation at Atlanta, Ga., during the foundation work for the new First National Bank Building in that city, disclosed a cast iron shield, believed to have been lost by one of the men accompanying DeSoto on his expedition to the Mississippi. This shield, an intricate casting of great artistic value, is supposed to have been made in Spain during the fifteenth century.

A recent letter from C. Albert Wettengel of the American Zinc, Lead & Smelting Co., indicates that the origin of cast iron was in the Far East and at a more remote date than previously recorded in historical metallurgical references. He writes:

"I have recently returned from an around-the-world tour, in the course of which I was one of the very few foreigners to ascend Tai Shan, the holy mountain near Taianfu, China. I thought you would be interested to learn that the temple on top of this mountain has three cast iron roofs, in use since the fifteenth century. So far as I could see, the roofs seem to be in perfect condition and to have still more years of service ahead of them than have already passed."

Still another pertinent letter on the subject has been received from Perry O. Hanson of the Methodist Episcopal Church at Taianfu, China, citing the existence of cast iron incense burners bearing a native date equivalent to 1000 A.D.

Origin of Cast Iron

If we may believe the writings of H. T. Chang, Chinese philosopher and historian, who assembled numerous priceless scientific texts of the ancient civilization, translated into English by H. W. Chu, the age of cast iron originated between the period of 300 B.C. and 100 A.D. In his memoirs on the geological survey in China, Tenengren refers to these works, and much of the information which fol-

lows has been taken by him from this source.

The first discovery of iron evidently took place many thousands of years ago. Undoubtedly, the wise men of some prehistoric tribes noted that the stone axes of meteoric iron decomposed into red clay and could be reconverted by heating in charcoal. Most likely they tried the same thing with red clay and smelted iron, but this great discovery is not recorded in history. All that we know of these early times is that iron-working appeared in a number of widely separated localities at about the same period. That it is much older than is generally believed seems indisputable.

European metallurgists appeared content, according to history, to work iron by the forge method for more than 2000 years. Highly impure iron was smelted by means of charcoal into a plastic mass and the impurities forged out with hammers. But in China, the metallurgical scientists, skilled in the casting of bronze, applied their knowledge to iron, and the result was cast iron.

The events leading up to this advancement in metal-working, about 300 B.C., as stated, are of exceptional interest to those concerned with early metallurgy, and indicate the progressive trend of ancient Chinese civilization. Reference to "metal" first appears in the old Chinese records in the Hsia Dynasty, about 2000 B.C. Yu, the Great, the founder of this dynasty, is stated to have cast nine tripods out of metal, presumably bronze, sent to him from the nine regions of the empire.

The dawn of the age of iron may be assigned to the centuries directly preceding the period of Ch'un-Chiu, about 722 to 481 B.C. The first mention of iron implements is to be found in the Kuo-Yu, a book written during the Chiu dynasty. A comment attributed to Kuan Chung, a statesman of Chi, about 685 to 645 B.C., is that "the 'good metal' (copper) is used for the making of swords and spears, while hatchets and hoes are made of 'base metal' (iron)."

Other available data of these times show that Meng Tzu, 372 to 289 B.C., confessed to the use of an iron plow. Han Fei Tzu, who died in 233 B.C., stated that weapons were still made of copper during the Ch'un-Chiu period. A little later, however, according to Laufer, 219 B.C., iron came into its own for weapon purposes, replacing copper and bronze forever.

The records set forth that the cast iron of those days was of good quality, and the use of the material grew rapidly among these ancient craftsmen. During the reign of Emperor Ming Ti, 58 to 75 A.D., suspension bridges, some about 1000 ft. in length, were built over different deep gorges in Yunnan, formed of wrought iron chains and cast iron pillars.

A remarkable discovery seems to have given the impetus for making possible the use of cast iron at this time. Chinese irons are very low in phosphorous, but, evidently, experiments determined that the addition of a certain amount of that element in the form of animal bone enabled the thick mass of molten metal to become fluid and to be poured easily. Castings, formed of this material was the natural outcome. This appears to be one of the basic factors in the development and progress of cast iron in China.

The early history of the art is so clouded in legend and lore as to be difficult of accurate conception. For instance, there is the famed story in a novel of the Han dynasty, "Wu-Yuch-Ch'un-Chiu," telling of the daughter of Kan-Chiang, a noted iron-master of King Wu Shan, who threw herself into a mass of molten iron, making possible the casting of the great bell for the Ta-Chung-Ssu Temple at Pekin.

In those days, charcoal was the fuel generally used for reducing ore to iron, and for remelting purposes. At Shansi, however, anthracite coal was employed from an early date, about 1100 A.D., due to the proximity of the coal mines to the ore resources. And at a time not much later, a "smokeless coal," (probably coke) is described in the book by Chang, referred to, as being used for the smelting of iron in this same Chinese province.

Ancient Process Described

The original Chinese method of manufacture is described in an ancient Chinese technical book, "Meng Hsi Pi Tan," of the Sung Dynasty. Note how well it corresponds to modern practice. The book states as follows:

"Iron ores are smelted with charcoal in a shaft furnace. The blast is obtained from a box-blowing engine of wooden construction. A piston is moved backward or forward by human or animal power. The air enters through openings provided with valves in the side of the box, and passes out to the furnace through a passage formed by placing in the box a perpendicular parting wall connected with the piston chamber by valves at both ends. From this passage, the air passes

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A CHINESE temple with a cast iron roof which was made and put in place sometime during the eleventh century. The iron incense burner in front of the temple was cast at approximately the same time.

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CLOSE-UP view of a cast iron roof. Both the building and the roof are over 500 years old.

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through a tuyere into the furnace. From the furnace, the metal produced flows to a reservoir, and from there it is ladled out into moulds for castings.

"Another portion is conducted direct to the furnace, and is purged as wrought iron. The furnace for the manufacture of iron is made of clay mixed with some salt. A hollow in a mountain is sometimes lined with clay, or a large wooden mould is used and the furnace allowed to dry for a considerable length of time. Such a furnace holds two or three tons of ore.

"The furnace for making wrought iron from crude iron or pig iron, produced in the foregoing blast furnace, is a rectangular pit surrounded by a low wall, on which several men stand in order to stir the metal with willow poles. At the same time, a fine powder of salt clay is scattered over the bath. After some time, the iron becomes malleable and is divided into blooms.

"For the manufacture of steel, wrought iron is hammered into thin rods, about 1½ in. long, which are charged into a furnace lined

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CAST iron roofs on buildings surrounding the Chinese shrine "Old Lady of the Mountain." This roof was cast and laid some 500 years ago.

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with clay. Above this wrought iron is placed pig iron, and above this, the fuel such as charcoal or wood is placed. Above all is placed a covering of clay. The fire is lit and the blast turned on until the pig iron melts and is combined with the wrought iron, and is thoroughly mixed. The mixture is then poured out of the furnace into sand or a closed mould."

The only essential difference between the modern method of ironworking and this process, as described in the old Chinese text book quoted, is one of detail. Today the blast comes from a perfected blowing engine unit, actuated by a prime mover. The ancient Chinese did not possess or have knowledge of the development of power. The furnace blast which they employed resulted from treadmills and hand pumps and, needless to say, production was small. The processes, however, and basic considerations given were greatly similar to those of modern times.

There were many and varied uses of cast iron in ancient China, as existing records point out. These included cooking utensils of different kinds, wheelbarrow axles, tools of all varieties as then in service, plough shares, incense burners, stoves, bells, vessels of various shapes and sizes, to mention a few of the more prominent items. Cast iron evaporators for sugar utility were another development of the early Chinese, designed and built according to the ideas of the scientists of those times.

Further, cast iron for structural purposes was an important feature in the use of the material, according to historical references, including columns, parts for buildings, bridge members, structural ornaments and the like. A notable example of the application of cast iron for roofing is found in the Tai Shan Temple, constructed some 500 years ago and still in service, referred to in an earlier comment above. It is possible that more extended and intimate research would reveal similarly impressive exhibits of cast iron in old China, with utility and service down through the ages demonstrating the enduring characteristics of the material.

With a background dating from 300 B.C., there is no telling how the ingenuity and ability of the ancient Chinese sought the merits of cast iron for their needs and requirements in that period of existence.

Private Plans for Economic Security

AID in developing economic security for American workers is being voluntarily provided by many employers in all major industries. This help is supplied through such mediums as guaranteed employment, dismissal compensation, group life, health and accident insurance, mutual benefit associations, pensions and loans to employees.

The foregoing information is from a recent nation-wide investigation of industrial relations policies by the National Industrial Conference Board. The survey covered 2452 business establishments in manufacturing, mining, transportation and communication, wholesale and retail trade, finance, and public utilities. The employment represented by these companies totals over 4½ million, or 15 per cent of all persons gainfully employed in the industries covered by the survey.

Of all the employees included in the conference board's study—

Group life insurance policies protect 61 per cent. For the entire country group life insurance coverage exceeds $9,000,000,000.

Loans for emergencies are available to 58 per cent.

Mutual benefit associations, maintained largely by the workers to provide benefits when members are incapacitated, cover 54 per cent.

Formal pension plans cover 44 per cent.

Dismissal compensation, group health and accident insurance, and relief funds protect about a third of the employees covered.

Guaranty of employment, a relatively new development and probably the most difficult policy to put into operation, was reported by 39 companies. A third of these were in the food products industry. Six such plans are reported by the metal products industry, three are in printing and publishing concerns, three in textile plants, and two each in the chemical, leather and its products, machine and machine tools, and gas and electricty industries.

While a higher proportion of large concerns provide group life insurance, small companies make a strong showing. Of those employing less than 100 workers, 48 per cent have such policies in force, and of those with 100 to 250 employees, 56 per cent.

On the other hand, 35 per cent of companies with more than 5000 employees provide dismissal compensation as compared with 5 per cent of companies employing less than 100 workers.

Likewise, 43 per cent of the large companies have formal pension plans as compared with 3 per cent of those with fewer than 100 employees.

Dismissal compensation is especially prevalent in the chemical, printing, and rubber industries in the manufacturing group. Banks, mercantile establishments, and petroleum refining head the non-manufacturing group in reporting this policy.

Printing and publishing leads the manufacturing industries in providing group life insurance. Seventy-four per cent of the companies in the printing and publishing field reported this activity. In seven other industries, 65 per cent or more of the companies covered have group life insurance. Among non-manufacturing industries, gas and electric utility companies, and banks are ahead in the proportion of group life insurance policies reported.

Formal pension plans are more numerous in the non-manufacturing group, transportation and communication, insurance companies, and gas and electric utilities being outstanding in this connection.

Photo by Sovfoto

Blast Furnace Plans

WHEN a desire becomes an obsession, progress is inevitable. The Soviet obsession is to have an ultra-modern and self-sufficient steel industry. Plenty of pig iron is needed, and the Soviet position as a world producer has risen from fifth to second place during the past five years. In the U.S.S.R. this growth in pig iron production has become symbolic of the country's progress, and the lowly blast furnace has been elevated to a position of ornamentation. The fountain shown here is really a miniature blast furnace, and is located in front of the administration offices of the Khatayevich Metallurgical Plant on Dniepropetrovak (Ukraine).

By B. M. SUSLOV

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THE industrialization of the Soviet Union, according to the Second Five-Year Plan of Development of National Economy (1933-1937), demands a large quantity of iron and steel. With this demand in mind the Seventh Party Congress arrived at a number of decisions regarding the iron and steel industry. These decisions were, first, a complete liquidation of pig iron and steel making equipment and metallurgical practices straggling behind the general time of development of national economy, and, second, to double during the Second Five-Year Plan the output of ferrous metallurgy and to overcome the disproportion in production capacity of blast furnace plants, steel plants and rolling mills as quickly as possible.

The increase in the output of ferrous metallurgy during the Second Five-Year Plan is supposed to follow the outline given in Table I. It is apparent from this table that by 1937 the Soviet pig iron output should be increased by 9,800,000 tons, which is more than a 160 per cent increase over the 1932 level.

During the First Five-Year Plan period (1928/1929 to 1932) the Soviet output of pig iron was supposed to advance by 2,900,000 tons. An examination of Table II will show that actual Soviet pig iron output reached this planned level. Thus it is permissible to assume the 1937 production will be that which is designated by the Second Five-Year Plan.

In accordance with these demands of the Second Five-Year Plan, a number of additional blast furnaces, steel works and rolling mills have been completed or are in the process of construction.

The capital required in the construction of metallurgical works and mines to fulfill the Second Five-Year Plan amounts to 9,340,000,000 roubles against 2,960,000,000 roubles invested during the First Five-Year Plan (1928/1929 to 1932). The 9,340,000,000 roubles is to be distributed as follows:

(1) For completion of construction of metallurgical works begun during the First Five-Year Plan period, 4,280,000,000 roubles.

(2) For construction of new metallurgical works to be installed during the Second Five-Year Plan period, 1,090,000,000 roubles.

(3) For construction and repairing of metallurgical works in operation at present, 2,820,000,000 roubles.

(4) For reconstruction and development of iron ore and manganese ore industries, 1,150,000,000 roubles.

The Second Five-Year Plan involves 5,370,000,000 roubles for the construction of new metallurgical works. Thus 65.6 per cent of the entire capital investment will go

ns and Prospects in the U.S.S.R.

into the iron and steel industry, exclusive of the ore industry.

The construction plan of new blast furnace plants provides for the creation of the following new production reserves:

(1) The yearly production capacity of all blast furnaces should be equal to 21,800,000 tons of pig iron by Jan. 1, 1938, and the total output of pig iron in 1937 should equal 16,000,000 tons.

(2) The production of pig iron in the U.S.S.R. will reach a maximum in 1937.

(3) In 1937 the blast furnace plants with a yearly output of more than 600,000 tons of pig iron will account for 70 per cent of the total pig iron, as against 10.3 per cent in 1932.

(4) The number of blast furnace works with a yearly output of more than 1,000,000 tons of pig iron will be equal to eight at the end of 1937, as against a probable 16 in the United States and eight in Germany.

(5) The average yearly pig iron output of one blast furnace works in the U.S.S.R. in 1937 will be equal to 500,000 tons (excluding charcoal blast furnaces), as against 246,000 tons in 1932. In the United States in the year 1929 the average yearly output was equal to 367,000 tons (without charcoal blast furnaces) and in Germany it equalled 298,000 tons.

(6) The average daily pig iron output of one coke blast furnace will be increased from 247 to 475 tons.

(7) The number of blast furnaces with a volume of more than 900 cubic meters will exceed 40 in the U. S. S. R. by 1937, as against 17 in the United States and 2 in Germany.

(8) The yearly pig iron output per worker will be increased from 255 in 1932 to 710 tons in 1937. In the United States this figure reached 1734 tons in 1929 and in the same year in Germany the figure was 612.

(9) In 1937 the U. S. S. R. will occupy second place as a world pig iron producer, and will be the largest European producer.

From Tables IV and V it is apparent that the total number of blast furnaces which are to be constructed during the five years is equal to 45. In the first three years of Second Five-Year Plan (that is, by the end of 1935) 20 of the 45 new blast furnaces fixed for the entire five years are to be operating. A number of these furnaces have already been started.

Because of efficient operation of existing plants, output in 1934 of pig iron exceeded the plan by 4 per cent, whereas in 1935 an overfulfillment of 4.5 per cent was expected.

One of the most important problems of Second Five-Year Plan in the field of ferrous metallurgy is the large development of iron ore enriching. In 1932 only 5 per cent of the iron ore mined in Krivoy Rog district (South Russia) was enriched (disintegrated and screened). The plans are that by 1937 over 70 per cent of all the iron ore mined at Krivoy Rog in South Russia will be enriched,

(CONCLUDED ON PAGE 79)

TABLE I

The Increase in Output of Ferrous Metallurgy Demanded by the Second Five-Year Plan

(In Millions of Metric Tons)

	1932	1937	Per Cent Increase
Pig iron	6.16	16.0	160
Steel ingots	5.90	17.0	188
Rolled steel	4.29	13.0	203
Steel tubes and pipes	0.31	1.1	255
Iron ore	12.06	34.0	183
Manganese ore	0.83	2.7	225
Coal	64.33	152.5	137
Coke	8.41	21.3	153

TABLE II

Pig Iron Output Planned and Achieved

(In Millions of Metric Tons)

	1932	1933	1934	1935	1936	1937
Output planned	6.16	7.25	10.0	12.2	14.0	16.0
Actual output	6.16	7.11	10.44	6.014*	...	...

*For first six months.

TABLE III

Pig Iron Output in the U.S.S.R. and in All Other Producing Countries

(In Thousands of Metric Tons)

	1929	1932	1933	1934	1935*
All other countries	94.270	33.367	42.222	52.200	27.703
U.S.S.R. production	4.320	6.161	7.110	10.440	6.014
Output of the U.S.S.R. compared with that of all other countries (per cent)	4.6	18.5	16.8	20.0	21.7

*First six months.

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A STEAM shovel as high as a 14-story building; a bucket that will comfortably hold 75 people and lifting power that would raise a 150-ton locomotive. Its perspective dwarfs the world's largest coal truck in the foreground, which will hold 25 tons of coal.

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Gigantic Is the Word

To Describe the New "Bobolink" Strip Mining Operation

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By FRANK E. FRIES

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SUPERLATIVES are not frequently used in these columns. But "largest in the world" seems to be the only appropriate phrase to use in connection with the strip mining apparatus at the Seelyville, Ind., "Bobolink" coal mine. Fifteen years, it is estimated, will be required to exhaust the resources of this deposit, even with the aid of the gigantic equipment recently put to work.

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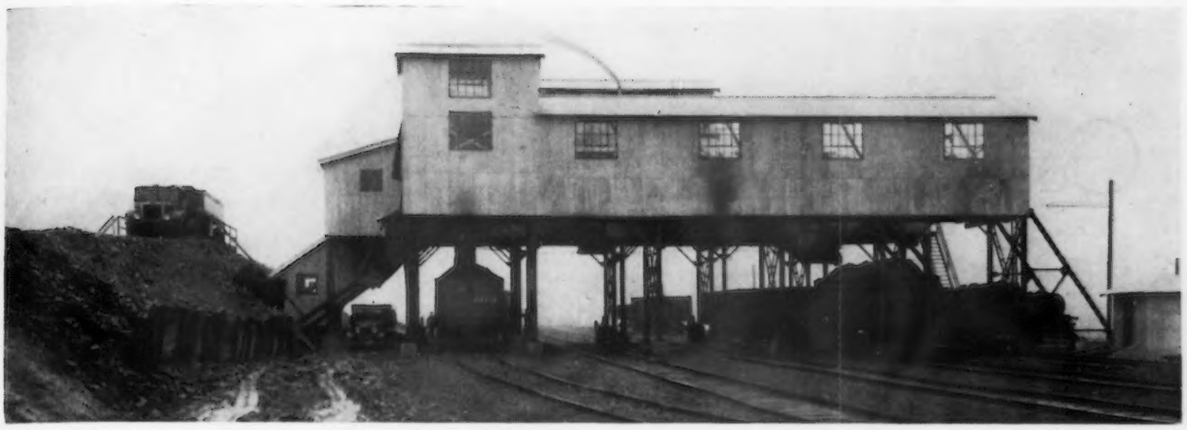
THE story of the Bobolink strip coal mine at Seelyville, Ind., reads like a page from Gulliver's Travels.

Picture in your mind coal trucks so large as to make an ordinary passenger car look like a toy machine in comparison; a stripping shovel towering as high as a 14-story building, weighing more than 2,000,000 lb., whose dipper can easily hold the entire population of Seelyville; trailers on great trucks that carry from 25 to 30 tons of black nuggets in a single load; an all-steel tipple that crushes, cleans, grades and dumps coal into railroad cars on five tracks at 300-ton-per-hour capacity.

These figures are spectacular to the layman but to the officers and employees of the Binkley Coal Co., largest strip coal mining company in the world, they are only cold, everyday facts about the mine eight miles from Terre Haute, Ind.

When Binkley's officers, Hubert E. Howard, president; C. F. Hamilton, vice-president in charge of operations; Mr. Gregory; and J. F. Molony, general sales manager, decided to open the Bobolink mine at Seelyville, they also decided to install the largest strip mining equipment units ever built. Five well-known manufacturing companies were called upon to build the equipment. They were the White Motor Co., Cleveland; the Bucyrus-Erie Co., South Milwaukee, Wis.; the McNally-Pittsburgh Co., Chicago; the Austin-Western Co., Aurora, Ill.; and the General Electric Co., Schenectady.



ONE of the most modern coal tipples has been built in connection with the Seelyville operation. It has a capacity of 300 tons per hour.

After a study and analysis of conditions and problems encountered in strip mining operations, White's engineers developed the White Model 691-SD420. These are the world's largest coal trucks and are 25-30 ton tractor-trailer units, having six wheels, four-wheel drive, air brakes, and powered by the White six-cylinder engines developing 140-hp. at 2050 r.p.m. The Austin-Western Road Equipment Co. built the trailers for the huge Whites—the largest trailers in the world. The entire tractor-trailer unit weighs 40,000 lb., is 40 ft. from bumper to bumper, 104 in. wide and 101 in. high. The trailer holds 33 cu. yd. of coal.

The tractor-trailer units are so large that special permits had to be obtained to transport them to the mine, and now they are not permitted to be driven on highways because of their weight and size. The trucks are used only to haul the coal from the loading shovel to the tipple.

A description of the Bucyrus-Erie electrically operated strip shovel is even more spectacular.

The monstrous shovel, which strips dirt from the top of the vein of coal, weighs more than 2,000,000 lb., is 14 stories high, and can move from 2000 to 3000 cu. yd. of earth every hour, depending upon digging conditions. It moves under its own power and looks like some mammoth prehistoric monster as it slowly crawls into digging position.

This electrically operated giant carries a 30-cu. yd., all-welded, alloy-steel dipper, large enough to comfortably hold 75 persons. To illustrate the size of the dipper, one of the great White tractors was backed cleanly into the dipper and easily lifted and swung about. To illustrate the power and strength of the shovel, one of the tractor-trailer units loaded with 50,000 lb. of coal, or a total weight of 90,000 lb., was swung by cables on the bottom of the dipper and was lifted and swung about with ease.

The huge stripper — Bucyrus-Erie Model 950-B—has a maximum cutting (or digging) radius from center of shovel rotation of over 115 ft. with a maximum digging height of almost 100 ft. The radius of the floor which the machine can clear for itself is 75 ft. The material can be dumped a distance of 215 ft. from the point where it is dug (almost a city block), and, to allow plenty of room for piling high, a maximum dumping height of 70 ft. is provided. This latter figure is comparable to the height of a modern, six-story office building.

The pull applied to the dipper of this machine may be compared to

(CONCLUDED ON PAGE 88)

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WHAT a bucket! It can swallow one of the largest White tractors at a bite and have room to spare for a couple of motorcycles.

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Gas-Fired Furnaces for Forging Tool Steels

AN improvement in the quality of finished product, coupled with decreased scale loss, has resulted from the installation of the first completely controlled gas-fired furnaces for forging of tool steels at the Chicago Heights, Ill., plant of the Columbia Tool Steel Co.

In addition to the initial installation, three additional furnaces have been converted to gas firing, and a complete conversion of the plant to the use of gas is in prospect as a result of the successful operation of these furnaces. The installations were made by the Mahr Mfg. Co., Minneapolis, under the direction of Robert G. Guthrie, chief metallurgist of the Peoples Gas Light & Coke Co., Chicago, in whose laboratory all the preliminary research leading to the installation was conducted.

The success of the Columbia installation is based on a new conception of gas, which involves a recognition of the fact that gas is a valuable metallurgical chemical in addition to being a source of heat. Mr. Guthrie and his associate, Oscar J. Wilbor have been engaged in research of this nature for a number of years.

Gas has been used as a fuel for forging furnaces with varying success at various times during the past 50 years. As a fuel alone, it showed some superiority over other fuels, due to its greater ease of control. However, it was not until the problem was approached from the present angle that the full advantages of gas were realized.

The Columbia installation now involves the conversion to gas firing of four furnaces with hearths up to 16 ft. in length and 7 ft. in depth, with loading capacities up to 20,000 lb. per charge. The work of conversion was not exceedingly complicated. The interiors of the furnaces were re-designed and re-bricked in order to give satisfactory dimensions and conditions for gas firing. Flue vents were installed in place of stacks, and fireboxes were bricked over.

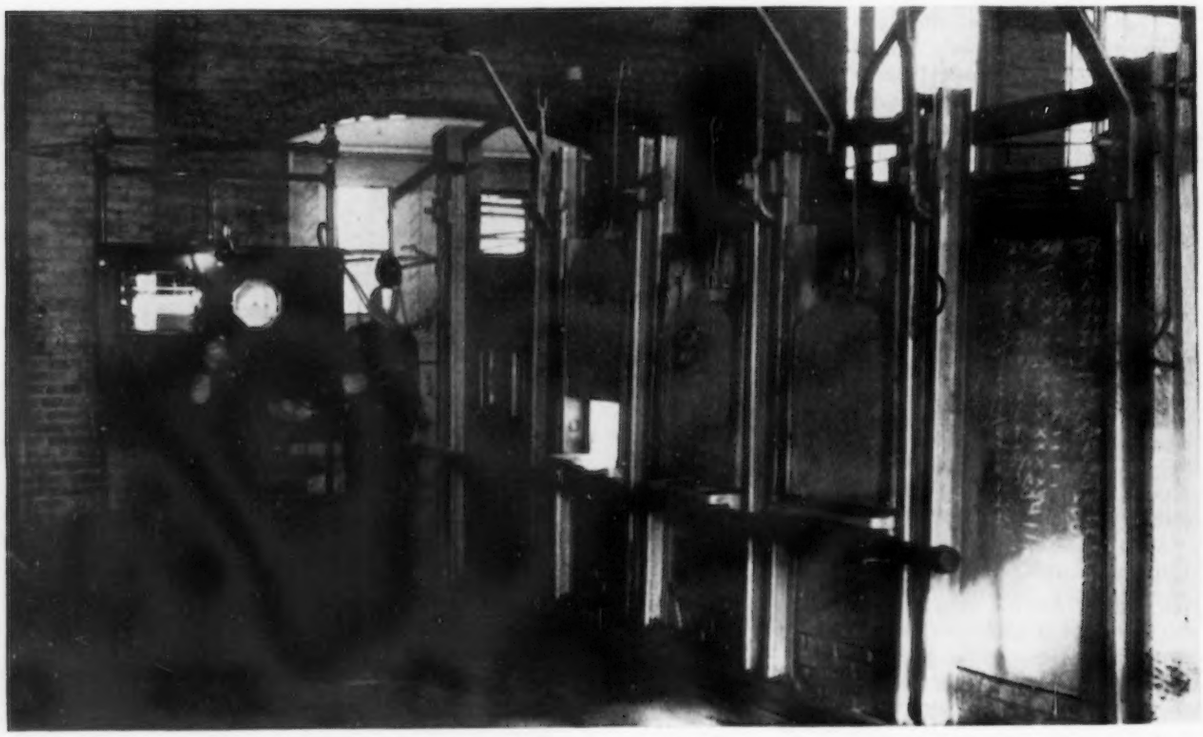

FIG. 1—Four completely controllable natural gas-fired furnaces are now in operation at the plant of the Columbia Tool Steel Co. Firing speed has been increased 500 per cent, and employees appreciate the greatly improved working conditions.

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FIG. 2—The new gas-fired furnaces have reduced forging decarburization by 66 2/3 per cent and scaling by 75 per cent. A uniform product is obtainable day to day and season to season.

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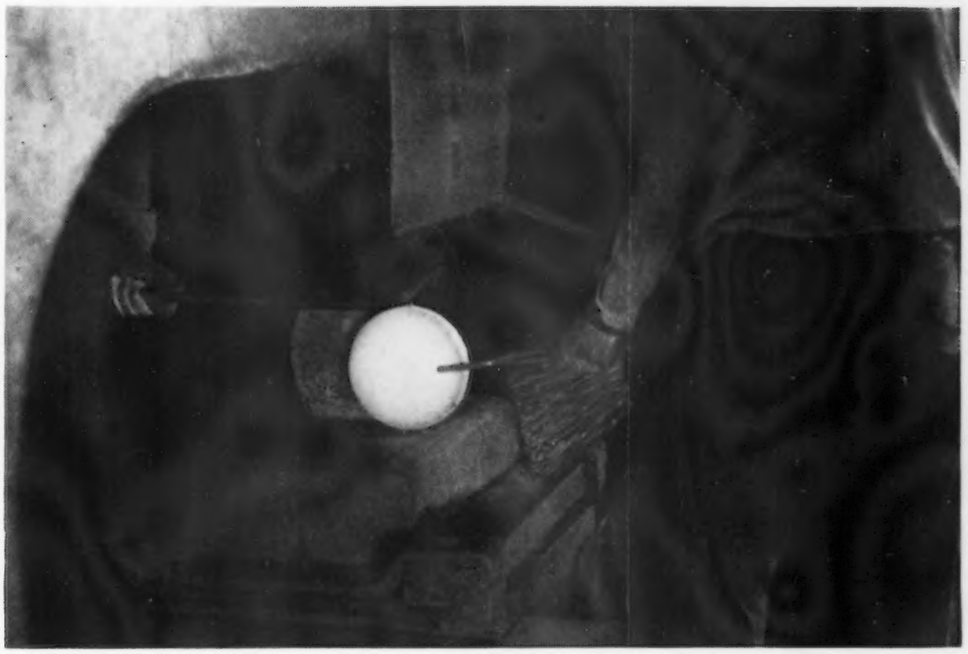

Each furnace was equipped with three Mahr low-pressure sealed in burners of special design, each burner having a capacity of 2100 cu. ft. of 1000 B.t.u. natural gas per hr. These burners were mounted in an especially constructed and proportioned combustion chamber. Air is supplied by individual blowers on each furnace.

Of special interest is the fact that the type of control which was attempted required that each furnace be equipped with two-position gas and air mechanical positive proportioning valves, with mechanical linkage and electrical operation. For this purpose a North America motor-operated valve was found best suited. In contrast with traditional practice, control instruments are set on an especially mounted control board close to the furnace and in full sight of the hammer crew. In addition to the usual recording temperature controller, the controls include gas and air regulating valves, a continuous gas analysis recorder for each furnace, highly accurate furnace pressure gages, and gas pressure regulators.

The crew foreman determines the heating program for any given charge. A slate is provided on which he lays out a 24-hr. program. A typical program, for instance, will run as follows: 11 p. m., temperature 1450 deg.; 3 a. m., temperature 1950 deg.; 5 a. m., temperature 2300 deg. At the hours designated, the night men set the temperature on the recording temperature controllers, and the hammer foreman can satisfy himself by a glance at the recorder, that his program has been followed and that the material is ready for working. This practice not only assures accurate temperature control but makes a controlled heating rate possible, with definite starting and finishing maximum and minimum temperatures.

Controlled heating assures not only that the work will be ready for the hammer crew in the best condition for forging, but the controlled atmosphere of the furnace plays an even more important role by assuring the quality of the finished work. By controlling the furnace atmosphere, decarburization of the surface has been reduced by 66 2/3 per cent, and scaling has been reduced 75 per cent. Scale that comes off with the first hammer-blows is paper thin. Previous losses, from ingots to finished bars, had run as high as 9.4 per cent.

Another important advantage to Columbia lies in the uniformity of the product from heat to heat, day to day, season to season, and year to year, which has resulted from the controlled atmospheres of the new furnaces and freedom from outside variables. There is no stack in connection with the furnaces, and therefore no inflow draft around furnace doors. Actually, one of the most important features of the entire design, the feature which makes possible all the control and uniformity, is the use of a relatively high positive furnace pressure. This condition makes the operation of the furnace entirely independent of outside weather conditions, which are often annoying in the operation of furnaces which depend upon stack draft in their operation. Because of this positive pressure, a curtain of air is provided by blowers which direct a thin sheet of air upward in front of the furnace doors, to protect the workmen.

Among the collateral advantages following the conversion to gas firing are improved working conditions for the hammer crew, no smoke, much greater cleanliness, and more healthful atmosphere. Firing speed has been increased 500 per cent, which is an important item, and all danger of overheating the work has been eliminated. The danger of underheating the work has also been eliminated. The thermal efficiency of the furnaces has been increased approximately 50 per cent by the elimination of stack and infiltration losses.

An additional advantage and economy, it is pointed out, would result in a new installation of gas-fired furnaces since the cost of erecting and maintaining a smokestack is entirely eliminated. Other economies result from savings in fuel handling costs.

Mechanical H
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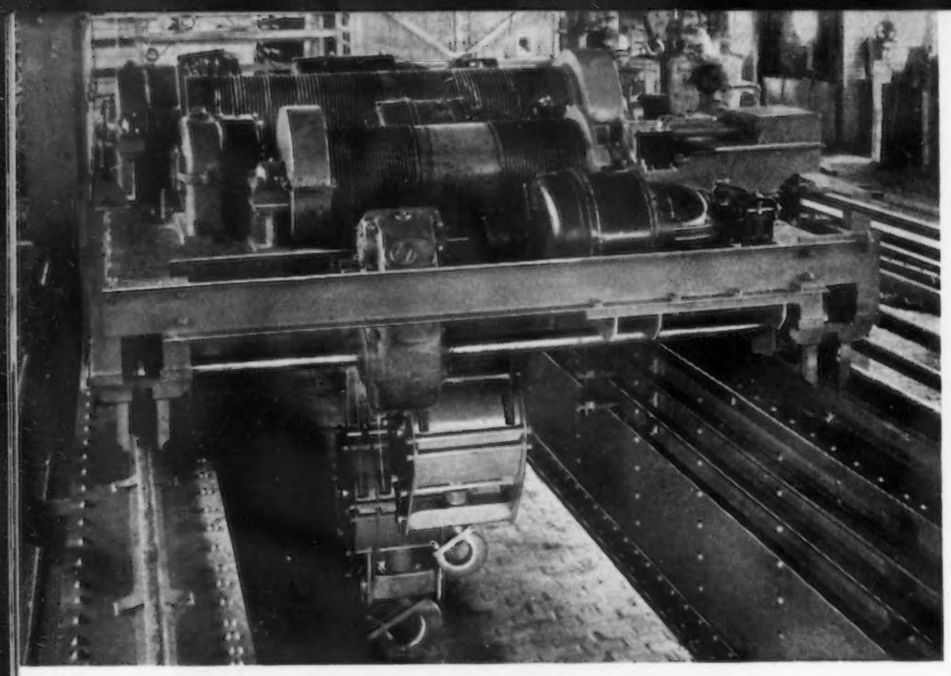

AT LEFT

FULL magnetic control and herringbone gear drives throughout are features of this 25 ton Euclid crane for the Los Angeles waterworks.

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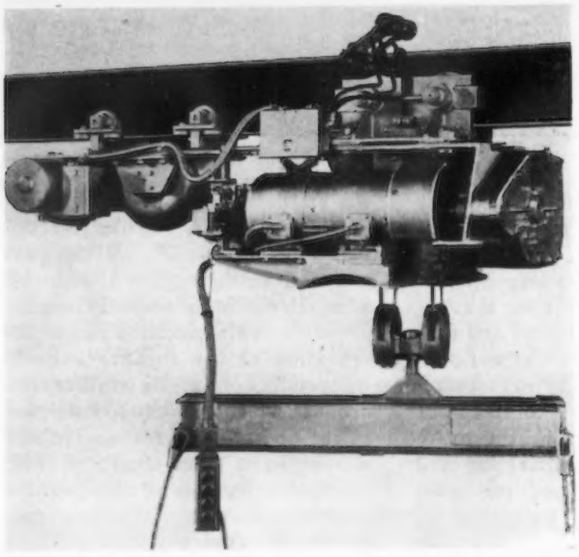

ABOVE

FOR hazardous operations, Robbins and Myers have produced an electric hoist having very slow and adjustable speed.

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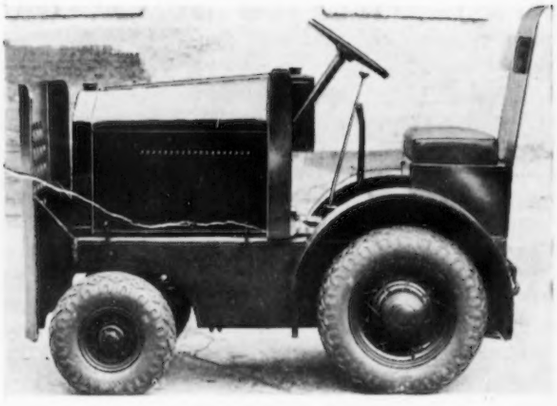
BELOW

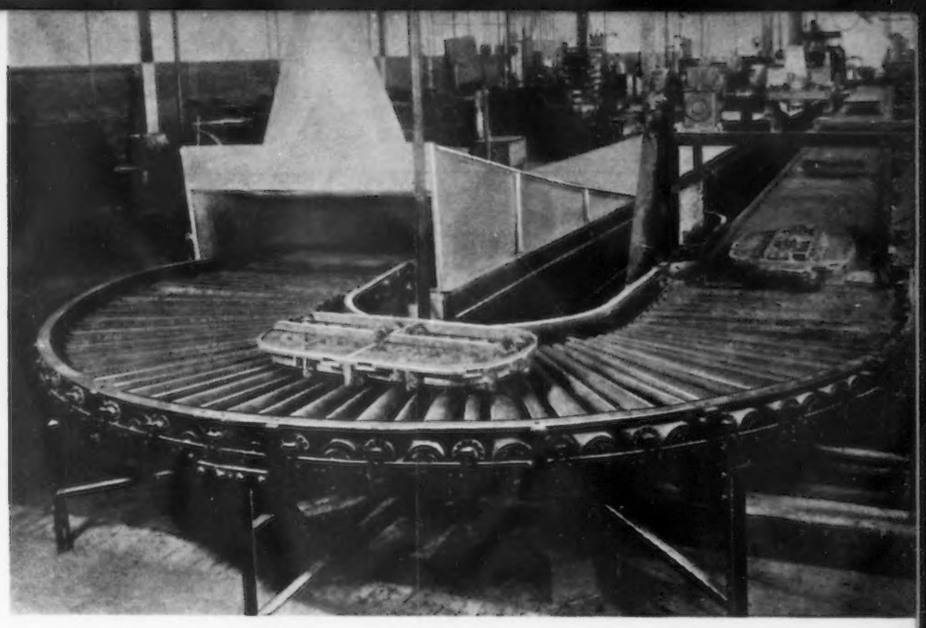
A NEW gas tractor, known as the "Banty-Quad" is a development of the Mercury Mfg. Co.



BELOW

A COMBINATION unit at work on a placer gold location in Montana. Materials handling reaches into the field of precious metals.

Handling Spots



AT RIGHT

MATHEWS CONVEYER CO. made this interesting installation for manufacturing Dunlapillo rubber cushions. It combines belt pallet and live roller types.

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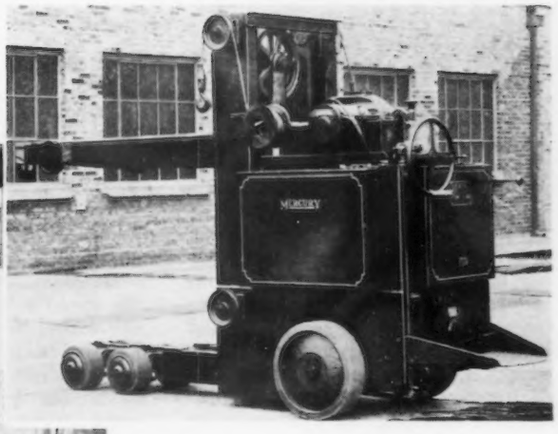
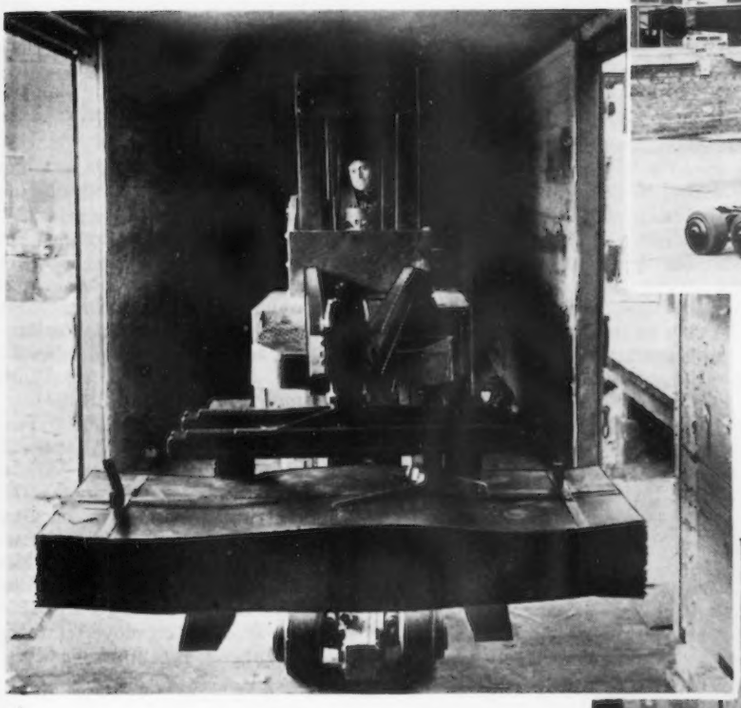


ABOVE

THIS new Mercury 10,000 lb. high-lift truck has a loaded speed of 4 miles per hour.



ABOVE

PICKING up a bundle of steel sheets with the new swivel fork of the Baker-Raulang electric truck.

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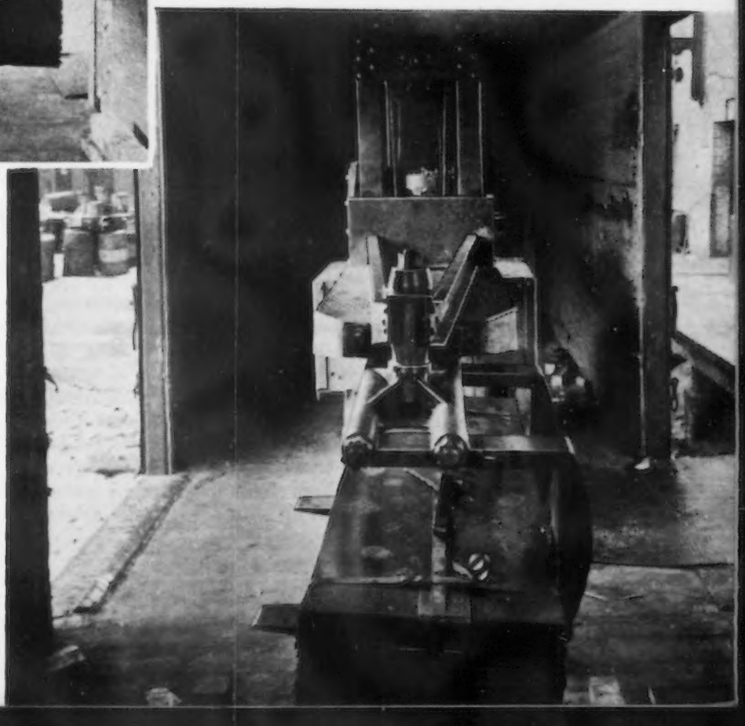
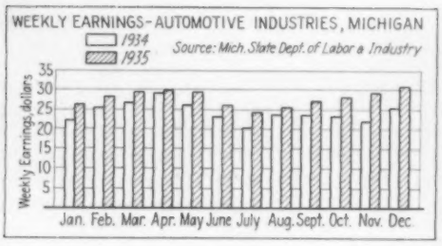
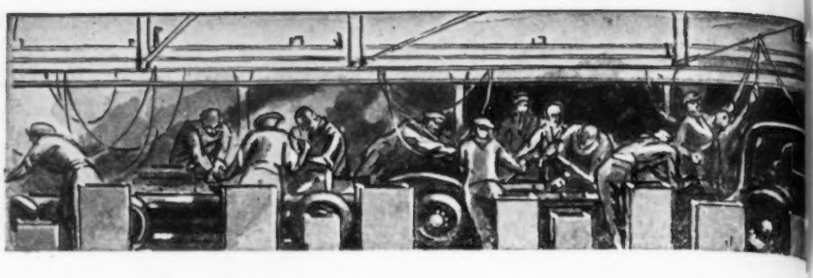


AT RIGHT

AFTER the bundle has been raised on the fork it is turned 90 deg. to minimize load side clearance.





THIS WEEK ON THE

Important Changes Ahead in Automotive Industry

DETROIT, Jan. 28.

PERHAPS the best way to visualize the automotive industry as a market for steel at the present writing would be to describe the frame of mind of a district manager found in his office a few days ago. There he sat, leaning back in his chair, one foot on the top of his desk, staring contemplatively into space. When asked as to the cause of his preoccupation, he replied: "I am wondering how I can increase the tonnage of this office or else convince the home office that the business simply is not there."

It is a well-established fact that the Detroit automobile plants are now operating on a four-day week. There is a general feeling that the manufacturers are marking time and awaiting future developments. Anticipated February schedules have been cut, and there has been exhibited a hesitancy on the part of the car builders to place orders for steel to be delivered four to six weeks hence. Orders received in the past week have been spotty, in that one supplier reported an active week-end, although most of the trade, like our friend mentioned above, found the going slow. Nevertheless, despite this temporary recession in productive activity, the outlook for the year still remains bright.

An election year, traditionally upsetting to business, has some factors currently that are favorable to industry. There will be little further baiting of business, particularly big business, at least until after the election. The inevitable taxes that must pay for New Deal spending will not be heaped on this fateful year. On the other hand, a goodly share of the Soldiers' Bonus, while not directly earmarked for automobile purchases, will find its way into Detroit through the spending of the butcher, the baker and the candlestickmaker all over the country.

Besides, there is the feeling that the great tide movement of recovery will move forward despite what man-made winds may do to ruffle the surface. A large factor in hastening this movement forward has been the fundamental optimism of the automobile industry. It takes just pride in the part it has played in pulling the rest of the country out of the muddle of the last five years. The car manufacturers spent money on machinery, on tools and dies, and on payrolls at times when it did not always look as if they would get their money back. Financial reports soon to be issued will confirm their optimism as far as last year's production is concerned. In fact, these profits will be so substantial that we are bound to see some of the surplus plowed back into the plants in the form of new machinery, new buildings, new tools, new and untried ideas.

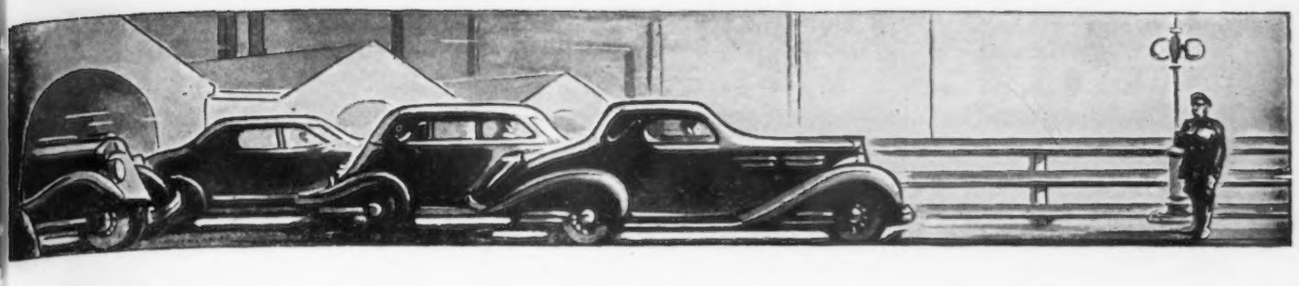
Good Year for Machinery

As if to reflect this state of the industry, machinery sellers report that 1936 will see the largest volume of machinery sales in the Detroit area in the history of the industry, even including the peak year of 1929. When one considers the slim pickings of some of the depression years, one almost questions the veracity of a man who says he expects to sell a half million dollars' worth of machine tools within the next 30 days. Yet this statement has been made. At least two machinery builders have closed on machinery orders in the last fortnight sufficient to keep their shops at capacity for months. They do not want the news to leak out for fear it will "kill" other business.

General Motors' stamping plant in Grand Rapids is the first sample of some of this "new optimism" spending. Machinery bought for this plant included ten lines of presses, four of them the largest yet to be constructed, four large planer-type millers, two standard millers, four large automatic die sinkers, besides much auxiliary equipment. Placement of 4300 tons of structural steel and 2000 tons of reinforcing bars with Jones & Laughlin was one of the largest structural awards made in the Detroit district in many a moon. Construction work will begin immediately, and the contract provides for the completion of the building by May 4. An average of 1500 workers will be employed on the project, largely recruited locally.

Use of Big Presses

Because the big presses ordered for this plant are 10 in. wider than anything heretofore built, some speculation is rife as to what these mammoth machines will be used for. As was mentioned in these columns last week, some important body changes are expected in 1937 cars. A great deal of this future trend stuff was hashed out at one of the sessions at the S.A.E. annual meeting. None of the prophets of the industry who spoke put date lines on their predictions, but aver-



ASSEMBLY LINE

By FRANK J. OLIVER
Detroit Editor, The Iron Age

aging their remarks, by and large, plus local gossip and conjecture by people inside the industry, this much seems to be fairly certain.

Cars are going to be wider and roomier, with less and less running board. Floors will be brought so low to the ground that a running board will be functionally unnecessary. Wider bodies will mean encompassing the wheels within the body outline and eliminating the fenders. This has already been done on a number of 1936 models and earlier. More of it will be seen next year. Chrysler and the Lincoln-Zephyr have proved the logic of the composite body and frame construction and the trend is definitely in this direction, particularly in the higher-price brackets.

It might be expected that, with the wider bodies, we should see greater body weight, but lest the steel industry should begin to count on greater tonnages, let it be remarked that by proper design in order to make every piece of metal count, the net result will be a lighter body, rather than a heavier one. William S. Knudsen's recent remark that a young man contemplating entering the automotive industry would do well to serve a period of apprenticeship in an aircraft factory is much to this point. "More brains, and less cast iron," was the way he put it.

New Designs Different

Using this composite construction, one projected design interpretation builds the body up in two halves welded together down the middle of the steel roof. And speaking of steel roofs, Pontiac recently let it be known that although production in 1935 was just 4 per cent below the 1929 level, it had consumed 132 per cent more steel. This tremendous increase in tonnage is attributed largely to the "turret top" roof. In the Pontiac, like all other General Motors' units at present, the top is made of a single sheet of drawn steel.

In keeping with the idea of more space for the passengers, the experts say that the trend is toward more compact power plants. Certainly much progress has been made in this direction in recent years. The Chevrolet engine is an example. The 1929 engine developed 46 hp. as against 78 hp. for the current model. Yet the only change has been an increase of ¼ in. in the stroke, adding 7 per cent to the displacement. This great gain in power with virtually no increase in size has come about through the development of better fuels and improvements in combustion chamber design. By increasing the compression ratio from 5:1 to 6:1, a great increase in efficiency has resulted.

Flexible Glass Promised

Flexible glass is on the way, and there is talk of a body shell of a molded plastic fitted over a tubular frame of steel. Let all continuous sheet mill operators shudder. Claims of durability, sound proofing and color possibilities are mentioned.

High propeller shaft tunnels in the middle of the tonneau have not proved popular, and are decidedly inconvenient in the low body. An offset transmission takeoff and the use of hypoid gears will enable the propeller shaft to run under a flat floor. Packard uses the hypoid construction now, and it is understood that only last week one of the Big Three placed an order for over a half million dollars' worth of generating machinery for cutting hypoid gears. So this design trend is more than a prophecy.

Whether or not a rear-engine mounting will be seen in a next year's car, aside from the *Scarab*, is still a moot question. There is no doubt that such designs will come eventually. Experimental cars are running around Detroit right now. There is even talk of dual tread tires to take advantage of the added weight on the rear wheels and to relieve the driving load on the tires. One thing is fairly certain, and that is that the first real production rear-engine "jobs" will appear in cars selling above $1,000, such as the Lincoln-Zephyr. In fact, with very little modification in body design, the present car could be converted into a rear-engine drive.

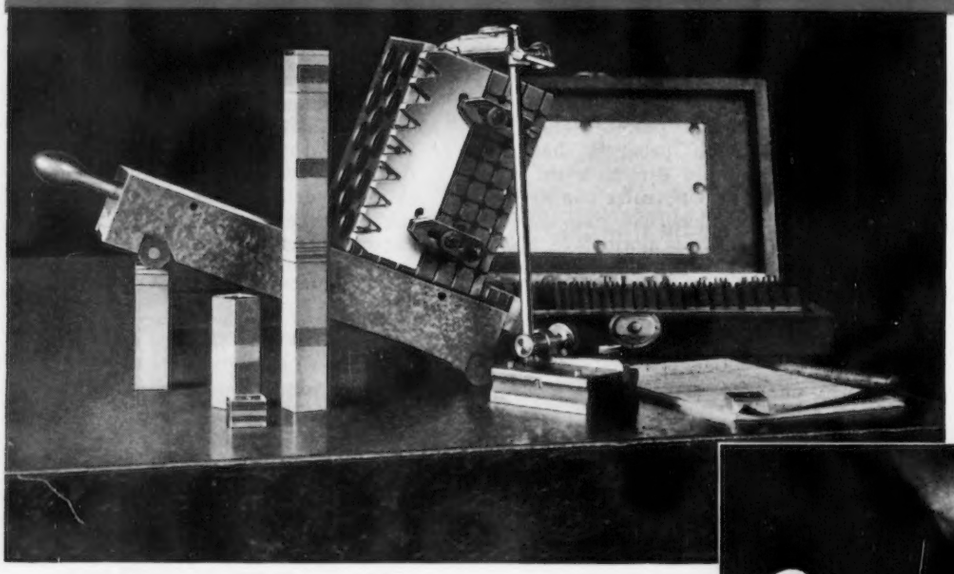
Past Figures Make Good Reading

So much for the future. As to the past, official figures are now coming in on last year's and last month's production. The Department of Commerce reports total factory production of passenger cars and trucks in the United States and Canada of 421,579 units in December, compared with 156,318 for December, 1934. For the entire years, comparable figures are 4,182,491 and 2,869,963 units. January production may dip to 380,000 units or under, based on the present activity in the industry.

That the automobile industry has seriously accepted the challenge of a better safety record is evident in the recent statement of Alvan Macauley, president of the A. M. A. All branches of the industry are to be united with nationally recognized safety agencies in a coordinated program.

The National Automobile Dealers' Association threw one in the laps of the manufacturers when it voted in New Orleans last week for a cooperative program that would put used car trading on a 20 per cent profit basis. The idea is to have a central auditing committee set up through the manufacturers, who would require monthly reports from the dealers on this score. The net result would be to reduce trade-in values and to eliminate one form of price cutting. The operation of the plan would add $8,000,000 to the cost of selling, a sum that the buyer would eventually absorb. It reminds one of the idea the mice had of putting a bell around pussy's neck. Who is going to attach the bell? In other words, will the manufacturers fall in line?

Choose the gages that last longest-you'll know them by this mark

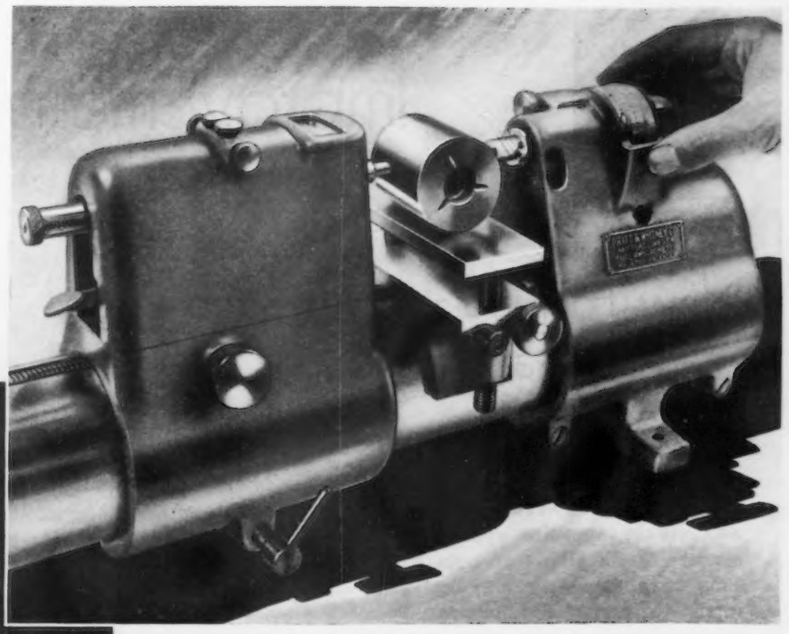


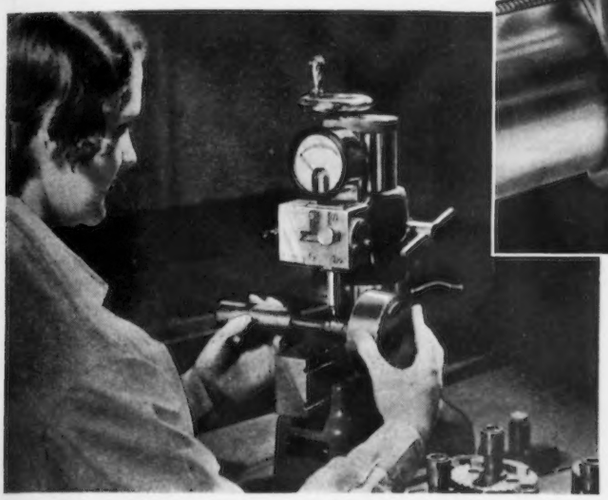
P & W Hoke Precision Gage Blocks are available in several convenient sets to suit individual needs—in sizes from .010″ to 20″. They are reliable masters and are universally accepted for their accuracy, hardness and stability. Ask for literature.

P & W Cylindrical Gages are made to A.G.D. standards or may be especially designed for particular jobs. They are made of the finest materials, heat treated under the most modern methods to almost file hardness, and are machine lapped to produce their fine accurate finish. They can be furnished chromium plated if desired, which adds greatly to their life. Ask for literature.

P & W Thread Gages are hardened, ground and then lapped to produce their final accuracy and long lived finish. They are measured and checked in exactly the same manner as is used by the U. S. Bureau of Standards. These gages are regularly furnished to A.G.D. standards, or may be made to order for special cases. Have you a copy of the P & W Gage Catalog?

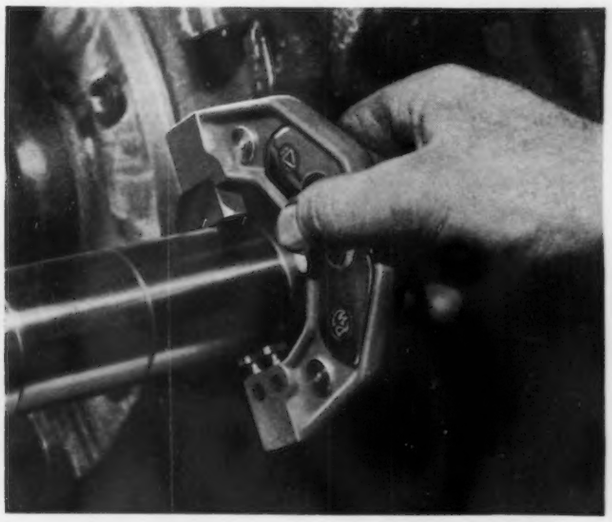
The P & W Supermicrometer presents a method of obtaining shop measurements to .0001″ with controlled measuring pressure. It has a capacity of 8″. P & W Standard Measuring Machine is accurate to .00001″. Information on either or both of these instruments is available. Write for it.





P & W Electrolimit Gages are made as both internal and external comparators and for continuous gaging. They are used universally by many industries ranging from steel mills to manufacturers of fine precision parts in both shop and laboratory. A completely illustrated book on the subject will be mailed on request.

P & W John-Sons Roll Thread Snap Gages analyze threads right at the machine and prevent scrap losses. They are fast and accurate, and reveal the exact natures of errors clearly. We will be glad to show them to you.



P & W Snap Gages are made in A.G.D. design and also in the P & W "Trusform" style. They are available in a full range of sizes, and are used widely for quick, accurate checking of production work. Complete information is available on request.

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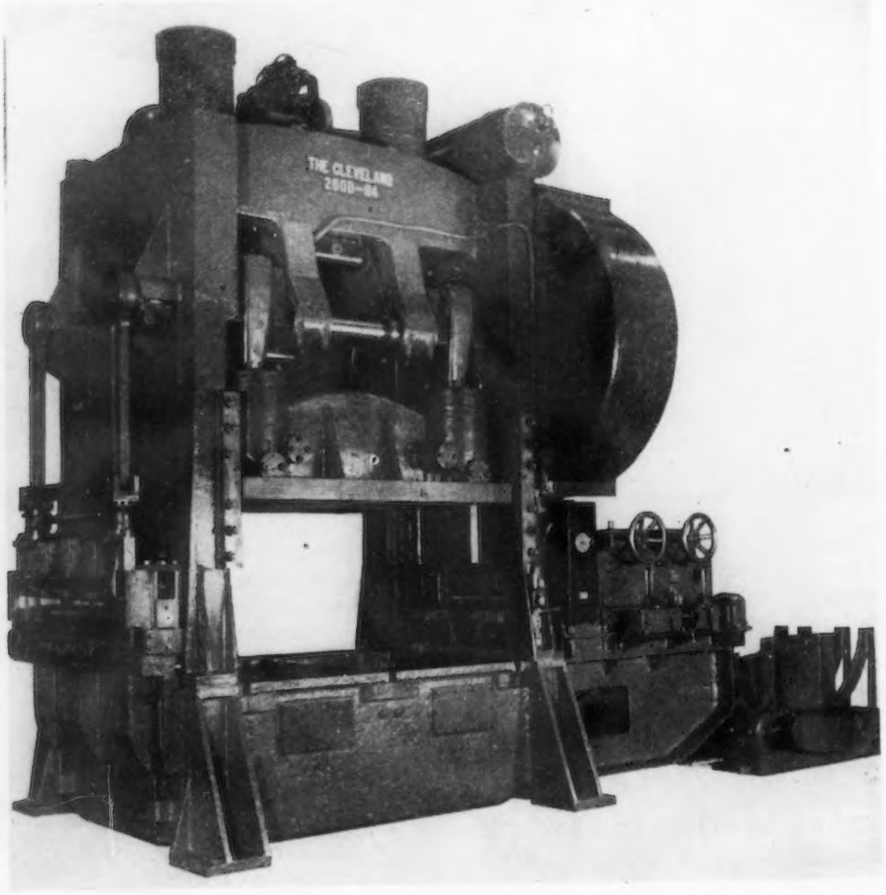
Improvements in Production

New Four Point Suspension Press For Blanking and Forming

IN a new press for blanking and forming, announced by Cleveland Punch & Shear Works Co., Cleveland, two shafts, each having connections at opposite approximate corners of the slide, are employed. This arrangement of connections tends to preserve alinement between slide and bed, whether the work be in the center or off center. The press illustrated is equipped with double roll feed having supplementary rolls for leveling or straightening the material before it reaches the dies and is arranged with an automatic uncoiler. A scrap cutter, mounted on the opposite side of the press, provides the means for shearing waste after blanking or forming.

The feed and press operation are syncronized through an interlocking system so that, in the event the correct amount of material has not been fed a predetermined distance into the press, the ram will stop instantly and remain stopped until correction is made.

Electrically controlled air operated friction clutch and brake and also self contained pneumatic draw cushions in the bed are employed. The slide is air counterbalanced. Air, for all air operated units, is supplied by a compressor mounted on the top of the press, giving service entirely independent of plant air system. The machine shown has 6-in. minimum and 60-in. maximum feed.



End Mill Sharpener Of Simple Design

AN end-mill sharpening fixture consisting of a cast-iron base and a rocking head and finger, has been announced by the Weldon Tool Co., 321 Frankfort Avenue, Cleveland. No centers or lead cams are employed, as the rocking head permits an end mill to be moved away from the wheel during grinding without changing the machine setting. The guiding finger contacts the inner side of the flute in such a manner that it revolves the mill only when the cutter is rotated against the spiral. Since the guide finger itself is mounted on the rocking member, there is no opportunity for it to lose contact with the flute. The result is that only one pass is needed for each flute in order to produce uniform and accurate back-off.

The device is adaptable to all types of fast steep spiral end-mills as well as to slow spiral types. Left or right-hand spirals are cut with equal convenience.

Illinois Gear & Machine Co., 2108 North Natchez Avenue, Chicago, has purchased all machinery and equipment of the William Ganschow Co. Division of Gears & Forgings, Inc., in Chicago.

and Shop Equipment . . .

Midget Metal Cleaning Unit Attaches to Production Machines

THE development of a midget metal cleaning unit for attachment to individual machines, or for use with single purpose groups of machines, or for small lots utility as a cleaning unit where quantities do not warrant the installation of more extensive equipment. is announced by the Metalwash Machinery Co., 27 Haynes Avenue, Newark, N. J.

In individual machine use, parts may be cleaned practically as fast as machine operations are completed. It is only necessary to make provision for routing them from production equipment to the cleaner. Thus the cleaning mechanism may become a unit in production line lay-outs.

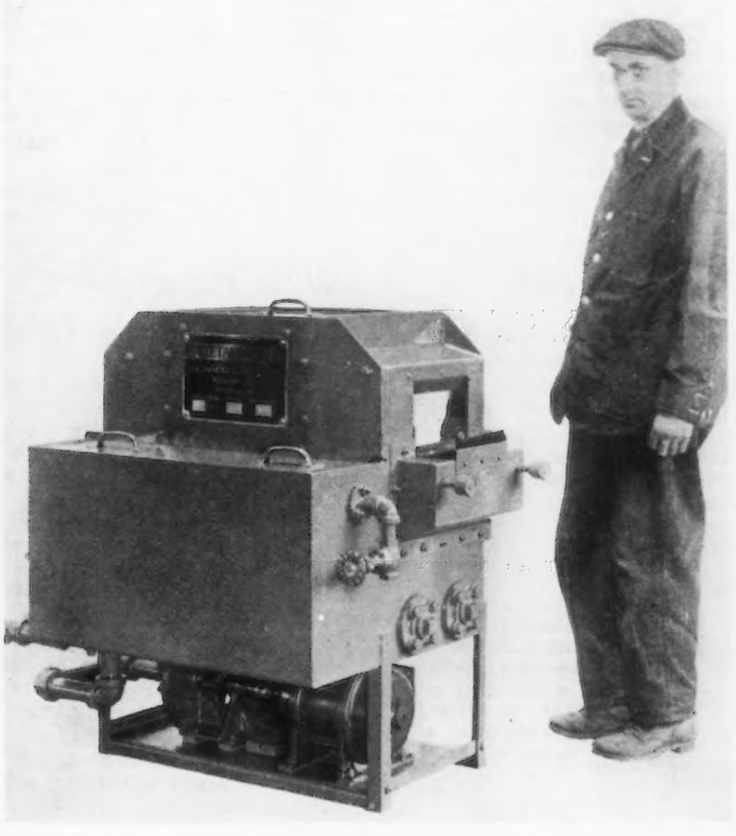
In group machine use, parts may be routed to a conveyor which charges the cleaning unit with the product of several machines employed on similar work, or chutes may be so arranged as to continuously charge from each of several machines.

For small quantity use, the equipment can be located at any convenient place for the manual charging. In any of these uses, the cleaned parts may be passed on or disposed of at the discharge end, in any manner best suited to production procedure.

The cleaning compound is either an alkali wash or an oil slush.

The chain-belt conveyor within the unit is 9 in. wide and has a clearance space above its surface of 6 in. A single hp. motor supplies the necessary power and provision is made for variable conveyor speed to suit the requirements of chip, grit, abrasive refuse, etc., removal. For use on small work, such as is somewhat common to screw machine products, for example, rotary, drum-type, spiral conveying is employed instead of chain belt.

The floor space required is 3½ x 2½ ft. Machine height is 3½ ft.

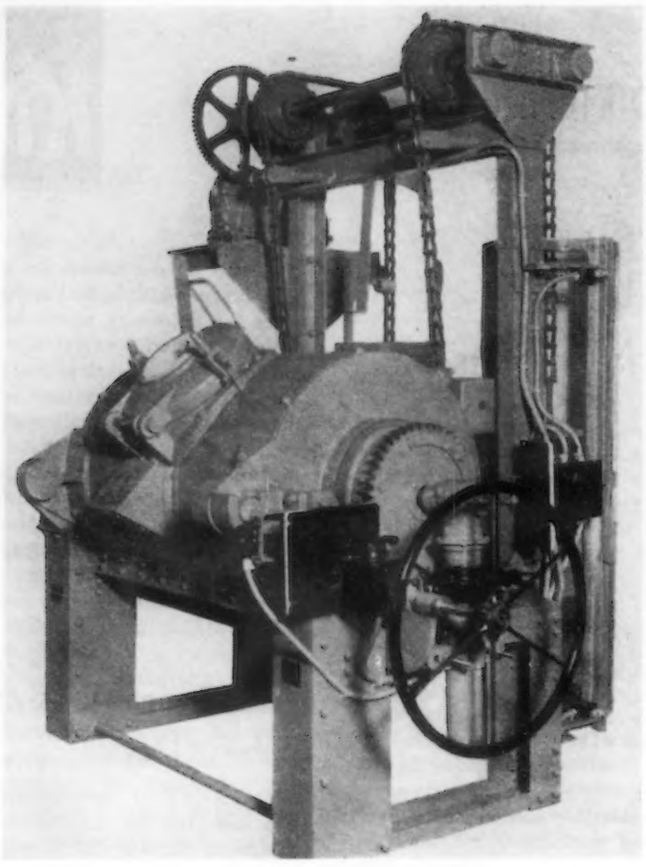


Proportional Gas-Air Mixing Device

UNVARYING ratio between gas and air for combustion efficiency is claimed for a new proportional mixer placed on the market by the Philadelphia Drying Machine Co., Philadelphia. A diaphragm actuated control valve, designated as a zero-governor, feeds gas at atmospheric pressure to an inspirator, into which the gas is drawn and mixed with air. As the gas enters at a constant pressure, the amount of gas inspirated is directly proportional to the quantity of air flowing through the inspirator, causing the two to combine in a constant ratio, subject to manual regulation by means of a valve controlling the rate of gas flow to the inspirator.

Stock Lathe Centers—Tungsten Carbide Tips

DEMAND for Tungsten carbide tipped lathe centers, which have been produced on special orders for some time, has resulted in the stocking of such centers by the Tungsten Carbide Tool Co., Detroit. It is reported that use of the centers is about equally divided between roughing and finishing operations. In rough work, wear from heavy side thrusts is said to be negligible.



Direct Lip Tilting Mold Pouring Furnace

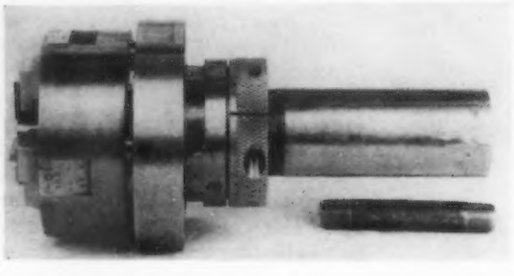
THE accompanying illustration is of a new stationary direct lip pouring furnace, oil or gas fuel, manufactured by the Monarch Engineering & Mfg. Co., Curtis Bay, Baltimore, Md.

The furnace is designated as No. 93 Simplex and has electric cutout for oscillation.

A gear motor is used to lift in pouring. Capacity is up to five tons per heat. The equipment is adaptable for the pouring of practically any metal.

Insert Chaser Die Head for Taper Threads

A NEW line of insert chaser die heads for cutting taper pipe threads is announced by the Eastern Machine Screw Corpn., New Haven, Conn. The head is designed to cause the chasers to recede at a definite rate to the point of predetermined length of thread; thereupon the die head instantly opens, withdrawing the chasers from the work. Positive action of the die head determines the actual taper. The action is obtained by means of a rotating opening cam placed between the back plate of the head and a knurled adjusting nut on the shank of the die head. The angular position of the opening cam is determined by a work plunger within the shank of the die head which, when pushed back by the work, rotates the opening cam at a predetermined rate. Both the cam and the plunger are adjustable. A fine adjustment for pitch diameter is obtained with the knurled nut. Chamfering and reaming tools may be used simultaneously with pipe nipples threading.



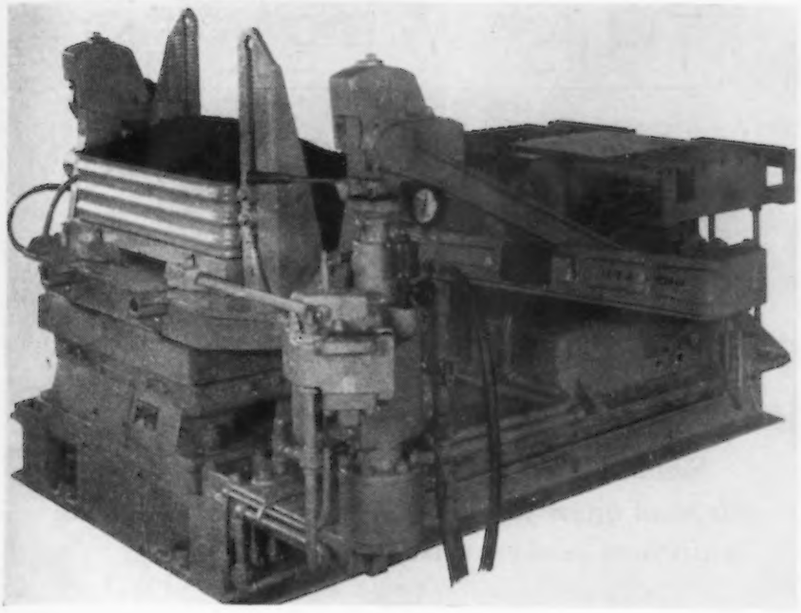
Convenient fine adjustment for pitch diameter is provided in a new line of taper pipe-thread die heads shown at the left.

Silent Chain Drive Calculator

A SLIDING card, silent chain drive selector has been brought out by Morse Chain Co., Ithaca, N. Y. At one "window" is brought out the r.p.m. of the driven sprocket, the ratio and the number of teeth for a selected r.p.m. of a driving sprocket. Another presents the outside diameter of the driving and driven sprockets, the standard center and the length of chain, all in inches. Low driving speeds are presented at the windows of one side of the selector, while high driving speeds are given at the windows on the reverse side. The calculator is 8¼ x 10⅝ in., made up of specially treated cardboard, buttoned together with the sliding member between. A number of convenient reference tables are printed on the front and back. Calculations are said to provide proper chain selections for approximately 95 per cent of installations within a range of ½ to 150 hp.

Wide Adaptability in Air Conditioner Line

INDUSTRIAL air-conditioner units in wide range are announced by the York Ice Machinery Corpn., York, Pa. Installation can be in any type of industrial plant, and either with or without ducts. A wide range of sizes is included in the line. An automatic float control, furnished in either high or low pressure type, is said to permit accurate control of the refrigerant, whether ammonia, circulating brine or cold water is used. Low headroom features the equipment which is inclosed in a heavy steel casing. Fans are of multi-blade design with V-belt drive to insure flexibility of speeds and ready adjustment of air volume.



High-Speed Equipment for Mold Making

"HI-SPEED" jarr rollover and pattern drawing molding machines, as built by Herman Pneumatic Machine Co., Pittsburgh, are illustrated by the model 402-B, here shown. Capacities range from 750 to 4000 lb.

Smoothness of action and simplicity of operations are said to be factors in the ability of the equipment to consistently produce molds complete in less than 60 sec. The machine illustrated is one of the 1500 lb. series.

Portable Motor Driven Worm Thread Grinder

THE cut herewith illustrates a new portable worm thread grinder by the Hisey-Wolf Machine Co., Cincinnati. A crank handle, through worm and worm gear, provides angular adjustment to either the right or the left. A clamp lever locks the spindle after angular adjustment. Handwheel raises or lowers the grinding spindle. A second hand wheel provides motor adjustment. Oversize precision bearings are employed throughout. A large heat-treated spindle is used. Drive is through V-belt. A universal wheel dressing attachment can be mounted on either end of the grinding spindle and is provided with graduated screw feed adjustment. The diamond holder can be mounted on either side of the wheel and has graduated feed. This new equipment is built in three sizes, 1, 3 and 5 hp., and for any voltage, alternating or direct current.

At left, a tilted position of a new worm thread grinder is presented.

Hydraulic Bench Vise Foot Operated

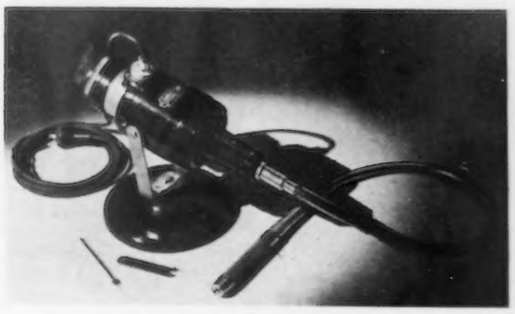
PATENTS covering a hydraulic bench vise have been granted by the U. S. Patent Office to Thomas A. Arnott and associates, 3853 Harding Avenue, Honolulu. The vise is foot operated and has an open throat feature which permits that work may be held in more convenient positions than is possible in vise types which present screw interference. A small power pump is located under the bench. Vises may be ganged along a bench and actuated by one operator on long work.

Governor Control for New Flexible Shaft Tools

THE K G vari-speed flexible shaft tool, illustrated below, is a new equipment manufactured by the Dumore Co., Racine, Wis.

Governor control is featured; a slight wrist twist controls a speed range from 1700 up to 12,000 r.p.m. with the tool delivering its complete ¼ hp.

The control features correct speeds for burrs, rotary files, grinding wheels and cutters on metals, woods, and composition materials. The shaft is 43 in. in length and the hand piece is of ball bearing construction. The collet type chuck has ¼-in. capacity.



THIS WEEK IN WASHINGTON

Business breathing becomes more difficult as Congress forgets President's promise.

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Senator Nye seeks relief funds to continue his mad quest for headlines with new attack on munitions makers threatened.

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New Deal leaves no stone unturned to prevent increase in taxes prior to election.

o o o

Walsh bill seems less and less likely to be passed in current session.

o o o

Rift in American Federation of Labor widens as miners' union backs Lewis to the limit.

o o o

By L. W. MOFFETT

Resident Washington Editor, The Iron Age

o o o

WASHINGTON, Jan. 28. — The so-called breathing spell for business probably has not been noticeable to the victim. . . . But if an occasional exhalation has been wedged between attacks it may be accepted only as a refreshing interlude. . . . For further attacks are under way and in contemplation. . . . It is strongly suspected that a great deal of the furor is simply political boondoggling, staged for campaign purposes. . . . Whatever else may be the outcome this sort of boondoggling adds to the other serious harassments of business, further shakes confidence and therefore impedes recovery. . . .

No doubt there are millions who do not at all agree with the President's cheerful observation that "if we can boondoggle ourselves out of this depression, that word is going to be enshrined in the hearts of the American people for many years to come." . . . At the outset there is nothing frivolous about the depression and further it is not going to be overcome by frivolous means even with a liberal downpour of Government checks. . . . Be it ever so eurythmic, dancing and reckless spending to pay both the dancers and fiddlers will not bring the country to prosperity. . . . Nor will constant attacks on business. . . . Quite the contrary is the case. . . . The truth of the observation is not affected by its triteness. . . .

Being in the class of "big business," as though that in itself is sinful, the steel industry is a popular mark, or at least its attackers so believe, to shoot at. . . . And in these days, if the assault is not coming from one source in Washington, it is coming from another. . . . With Congress in session it is natural that it should contribute its share of broadsides. . . . A late example is that coming from Representative Rich, Republican. of Pennsylvania, who has asked the Department of Justice to investigate proposed mergers in the steel industry. . . . Mr. Rich has particularly in mind consolidation plans of the Bethlehem Steel Corpn., to be considered by stockholders on Feb. 26. . . . Although President Eugene Grace has publicly announced many of the details of the plan and has stated that it would permit payment of taxes by the company as a whole which is certainly in accordance with the internal revenue act, Mr. Rich in a speech on the floor of the House made much of his statement that the corporation proposes to "throw off the holding company cloak and become an operating company" and that the object is to defeat the income tax laws. . . . The plan, of course, does not violate the revised law barring consolidated returns by a holding company. . . .

Not only the steel industry but other industries are reorganizing along similar lines, not simply because of taxation but also to achieve greater efficiency. . . . Mr. Rich also protested that the Bethlehem Steel Corpn. is also trying to "take over the Williamsport Wire Rope Co." by "paying $700 for each $1,000 bond." . . . In asking for stricter enforcement of the anti-trust laws, Mr. Rich referred

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STRIP STEEL

Continuous Improvement!

In 1897 there was no motor car industry although a few horseless carriages could be seen frightening the horses on the streets. That was the year West Leechburg Strip Steel was first made.

The continuous improvement in motor cars to date is obvious. Perhaps less obvious but none the less certain is the continuous improvement that has been made in West Leechburg Strip Steel during those 39 years.

Strip steel is our specialty and to its improvement we give constant attention. We put into it the uniformity and working characteristics required by a multitude of exacting users including motor car manufacturers. Deliveries are prompt too—just when you need them!

For an improved strip steel which is easy on your dies—try West Leechburg.

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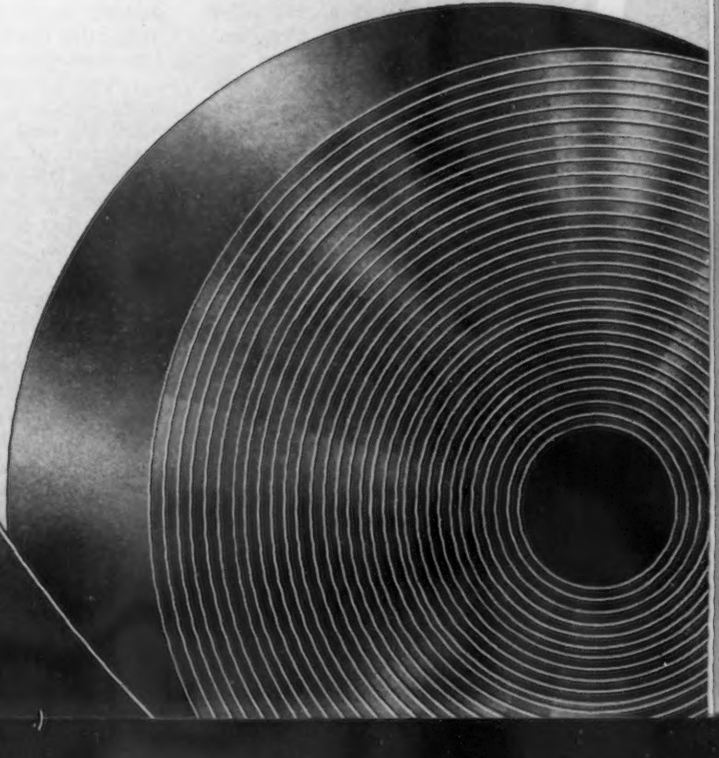
ST. LOUIS · TOLEDO (Dean Higgins & [illegible]) · [illegible] · PHILADELPHIA
TORONTO, ONT. (Jessop Steel Co.) · BUFFALO · ROCHESTER
SYRACUSE (Brace-Mueller [illegible])

Warehouse: JOS. T. RYERSON & SON



to proposed mergers of other steel concerns, including that between the Pittsburgh Steel Co. and the Sharon Steel Hoop Co., and the completed Republic Steel Corpn. consolidation, which the Department of Justice had attacked. . . . It abandoned that case when the Federal Court in Cleveland held that merger would not violate the anti-trust laws. . . . Mr. Rich's request of Attorney General Cummings for an "investigation" was referred to the anti-trust division of the Department of Justice, headed by Assistant Attorney General John Dickinson. . . .

Steel manufacturers also were listed for "investigation" by the Senate Munitions Committee whose efforts came to a halt with a bang when its chairman, Senator Nye, Republican, of North Dakota, unable to hold the front page through examination of the "House of Morgan," directed charges of falsification against President Wilson. . . . Greeted with withering blasts in the Senate by ardent supporters of the war President, and finding himself short of funds, the North Dakota Senator was compelled to suspend the investigation. . . . Bitter attack also was made on him from the Senate floor when it was learned he was using WPA and New York State funds for relief. . . . One Senator felt humiliated that the Senate thus found itself on relief. . . . And though Senator Nye was told that his request for further funds, boiled down to $7,500, would be curtly and flatly denied, he has proceeded hat in hand, to ask for the further contribution anyhow. . . . And he made no bones of the fact that he had received and would continue to receive, if they were offered, "honoraria" for addresses on taking the profit out of war which were supposed to be based on facts developing from a Government-financed inquiry. . . . Senator Glass, Democrat, of Virginia, in lambasting Senator Nye for his charge against President Wilson, said the inquiry had not developed a single fact that was not already well known. . . . The North Dakota Senator, in turning to what has been called his "smear Wilson" attack, got headlines that previously he no longer could make, only to be followed by distinctly adverse headlines when attacked in the Senate for his charges against the war President. . . .

Steel executives included in the list of witnesses whom Nye requested to appear before the committee include Mr. Grace; B. F. Fairless, president, Carnegie-Illinois Steel Corpn., Pittsburgh, and H. L. Frevert, president, Midvale Co., Philadelphia. . . . Included in the list also were makers of firearms and aircraft. . . . It is Mr. Nye's idea that it would be impossible to regulate the munitions business, whatever that is, or is not, and that the only logical course is for the Government to go into the munitions and war materials business, whatever they may or may not include. . . . North Dakota wheat no doubt would be exempted. . . .

It is the Senator's contention that the "growing interests" of bankers and so-called munitions makers "in the profits resulting from trade with the belligerents" forced the United States into the World War. . . . Even aside from the unfairness and implication of the contention, as testimony before the committee well shows, its fallacy is readily apparent when thought is given to the billions already paid and additional billions to be paid by industry and the public generally as the result of the World War through taxation. . . . Not alone decency, but common economic sense clearly shows that war is highly unprofitable in every way. . . . The recently enacted bonus law is a sample of the cost of war. . . . It must be paid for by present and future generations as a part of the enormous drains of the Federal treasury against which so many groups of citizenry have been encouraged to lean. . . . Where the money will come from doesn't bother the politicians, provided a hostile public does not rise and kick them out of office. . . . But this is the catch for politicians are much worried lest such a kick is about to be delivered. . . .

The money, of course, will come from taxation or further inflation that will reach alarming proportions. . . . One or the other if not both, will be inevitable. . . Taxation at the present session of Congress is a frightening thought for those who so easily vote away billions of dollars. . . . If it can be postponed until after election, it will not be so fearsome, though fearsome enough. . . . but it is inevitably coming in a big way. . . . It will not be on a politically contrived "soak-the-rich" scale but on a broad front that sooner or later will lower the brackets and reach down to the small wage earner and to the farmer who now escape. . . . Many who have been the recipients of unearned checks from the treasury will find the money has been put into one pocket only to be taken out of another. . . . Demagogic chatter of oleaginous politicians won't keep the tax collector away from the doors of millions who do not now know him. . . .

There are evidences that this fact finally is dawning upon most of the population, and that they are more concerned over it than they are interested in the organized tirade against the Supreme Court of the United States and demands for changing the Constitution. . . . The proper means for the change are always present. . . . But the Pharisees, with all the subtlety of a Model T engine, resort to perverted emotionalism and make cheap appeals by angular reference to the personnel of the Supreme Court itself. . . . The obvious purpose being to set up a straw man and to draw attention to its political complexion. . . . Directing scorn at the dominance of Republicans as a modern-day version of the scorn of the publicans as in the days of old. . . . These crusaders, many with axes of their own to grind, well know the court presides with judicial eminence, and without political bias. . . . The "record," which Al Smith lugs forth so frequently and joyously shows tremendous preponderance of unanimous opinions. . . . For those who want a change in the Constitution and are urging that it be done in an orderly way, there can be only respect as well as admiration for the thorough knowledge of the historic document some of them have. . . . This effort is entirely legitimate—and constitutional. . . . For mere political ranters, who apparently have never read the Constitution since their seventh grade class in civics, if then, a quite different feeling prevails. . . . And, incidentally, if some changes being urged were actually made, these ranters would find themselves ultimately deprived of the right to rant. . . .

It would be interesting, though the change is highly undesirable, to see what would happen if Congress should, if it could, bar the Supreme Court from declaring invalid laws passed by Congress. . . . Congress thus would be the judge of its own laws. . . . What a mess that would be! . . .

Some writers are said to have become atwitter lest their heated effusions against the Supreme Court might cause them to be cited for contempt. . . . but subsequently they have been calmed. . . . They have been assured that they mildly dignified their own importance. . . . Their attention was drawn to the fact that many others, almost as renowned as themselves, have attacked the court and it did nothing about it. . . . Thomas Jefferson, for instance. . . .

The raid to pauperize Uncle Sam and make the backs of taxpayers creak under a debt load of billions upon billions having penetrated the bonus sector of national bankrupt-

cy. The administration and its leaders are worried a great deal more than is evident from surface indications. . . . Some leaders in Congress, heretofore cagey on the subject because of fear of campaign repercussions, now openly admit that more taxes must be provided and they are extremely fearful that the program for raising the wherewithal will have to be adopted at the present session. . . . A horrifying spectre indeed on the eve of taking the hustings for reelection! . . . After gaily voting away mountains of money in their pandering quest for votes from favored groups, they sadly face the day for paying the piper; that is, of telling taxpayers that they have a bursting headache coming to them even though they had not participated in the orgy and even though many of them warned to no purpose against the mad dance of wild spending. . . . Laws, "however doubtful" their constitutionality, were enacted with irresponsible abandon and billions disbursed under them before they were knocked out by the Supreme Court. . . . Result: Agricultural contracts still pending, and "moral obligations" of some $296,000,000 that must be paid; some $200,000,000 in impounded AAA processing taxes that must be returned to processors; and the hastily prepared "stopgap" for AAA purposes with an initial appropriation of $500,000,000 which some prominent leaders in Congress balking that it is unconstitutional and will go the route of the original AAA act. . . . The plan is subsequently to break the latter into a litter of 48 little AAA's, and thus, under the aegis of State's rights, constitutionalize them with a permanent flow of financial aid from the Federal Government. . . . The scheme will probably meet with no constitutional objection but many doubt that it will work. . . .

A large item of appropriation yet to be made and one that is absolutely necessary will be for relief. . . . The AAA decision itself rendered meaningless the President's budget message even as it was being delivered. . . . And now it has been made even more cuckoo, as it was well known it would be before Congress convened, by enactment of the $2,500,000,000 baby bond cash bonus. . . . For it was readily evident that a vote-seeking Congress, indifferent to the burden upon taxpayers, would override the President's veto, so briefly messaged last week in confirmation of his prior veto of the bonus. . . .

Well deserved praise there is for the President's consistency. . . . And his first veto message will go down in history as a classic document of sound thinking and sound economics. . . . Claims have been made that his second veto was halfhearted and that he really "retreated" because his short message of disapproval was only perfunctory. . . . It has been charged, too, that he did not come out again before the bonus was finally passed at the present session and vigorously oppose it. . . . These criticisms hardly seem fair. . . . The President did vigorously oppose the bonus and emphatically said so. . . . He warned, too, that if it were enacted, means for raising the necessary money would have to be provided. . . . What more could he do than in effect simply refer Congress to his original veto which stated his case with remarkable strength and lucidity? . . . Rather it would seem objection might be better based on the point that the New Deal itself had set a glaring precedent for loose and extravagant expenditure of hitherto undreamed of proportions. . . . In any case, Secretary of the Treasury Morgenthau in vain had warned the Finance Committee when it was "considering" the bonus that its enactment would raise to $11,300,000,000 the amount that would have to be raised in the next 17½ months. . . . Payment by bonds is itself an extraordinary way of paying the insistent veterans and fear is felt that raising the money will entail extraordinary means. . . . Talk has broken loose of rampant inflation, and obviously the bonus act is an inflationary measure. . . . Revaluation of the dollar against gold, issuance of silver certificates against silver purchases and outright humming of the printing press were among topics that gained currency. . . . Some of it, no doubt, was stock market talk, which was lightly brushed aside by the Administration. . . .

The most serious thought turned to means of taxation and its dreaded effect. . . . Majority Leader Bankhead of Alabama conceded that new taxation may be inevitable and Senator George of Georgia, a member of the Finance Committee, apparently trying to lay the fault on the Supreme Court, rather than upon a heedless Congress, said he thought the scrapping of AAA would require the imposing of new levies. . . . But Senator Pat Harrison of Mississippi, chairman of the Finance Committee, up for reelection, held to his view that no new taxes would be necessary, perhaps with tongue in cheek. . . . Chairman Doughton of the House Committee on Ways and Means, the committee that originates all revenue legislation, asked if he would be surprised if taxes were "injected," said: "No, I wouldn't." . . . And he then added: "I wouldn't be surprised, however, if someone introduced a bill to change the hour of sunrise." . . . The persiflage is characteristic of Washington but has been overworked as a substitute for serious thought. . . .

But the thing on the minds of the spenders is that they must take up the ark of the covenant and pass over the people à la Joshua's command. . . . They're deeply puzzled over which will be the less painful form of taxation. . . . And the subject has been discussed rather freely behind closed doors. . . . All plans, no doubt, are tentative at present but they are straws showing the direction of the wind. . . . One suggestion, said to have been discussed, is for a 4 per cent general manufacturers' tax, with no exemption whatsoever, designed to bring in $1,000,000,000, which of course would only partially pay the mounting Government costs, racing at the rate of two dollars of outgo for one dollar of income. . . .

Another plan said to be under consideration by real experts, who view the matter realistically, is to broaden greatly the income tax base, lowering the exemption down to $750 with a tax of 8 per cent, hiking the present normal rate on small incomes, and raising the lowest surtax to 8 from 4 per cent. . . . This is apparently realization that the law of diminishing returns is as inexorable as the laws of the Medes and Persians. . . . If either of these plans really comes up for legislative action at this session—and they or some other far reaching plan must come forth in the early future—what a roar will reverberate over the land and what a gnashing of teeth and wailing of woe among politicians seeking to be kept on the Federal payroll! . . .

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Walsh Bill Won't Be Enacted?

There are conflicting views as to the probable enactment of the Walsh bill to compel adherence to code hours and wages by contractors on Government business or on operations financially aided with Federal funds. But the opinion grows that it will not be passed, at least by the present Congress. Whether accurate or not, it is reported that the Administration's interest in the measure has diminished greatly, if not entirely disappeared. Moreover, it is said that six members of the subcommittee of the House Committee on the Judiciary which is considering the bill are opposed to it. This represents a majority of the subcommittee. It is stated that there are also sharp differences as to pro-

posed provisions. One proposal is said to call for a flat 40-hr. work week with time and one-half pay for overtime and for setting up wage differentials regionally. The South, under this plan, would be permitted lower wages than the North, a matter which is said to be opposed by members of the committee from the North. The bill, as it passed the Senate at the previous session, made general contractors responsible for the production of supplies according to code standards by subcontractors. This feature is said to be definitely out.

Even beyond the reported differences of view among members of the subcommittee over proposed provisions, it is said that there is an increasing realization of the impractical nature of the measure, such as separating raw materials and production operations between output subject to the proposed legislation and that intended exclusively for private consumers.

Organized labor still insists that the bill be passed, however, and this is held to be the reason for continued consideration of the legislation despite the apparent desire of members of the committee definitely to shunt the bill aside. Also the bill still is being urged by some members who feel that if it can be brought out of the committee and favorably reported it would quash the Black-Connery 30-hr. week bill and thus not compel them to go on record against this measure which they oppose. Enactment of the latter bill is considered to be altogether unlikely.

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Railroads Ask Continuance of Surcharges

In filing a petition with the Interstate Commerce Commission last Friday for continuance of existing freight surcharges, Class I railroads asked that they be authorized to continue the rates without expiration date. The existing rates were authorized by the commission last year to remain in effect one year and unless continued would expire on June 30. The plan is to make the rates part of regular schedules.

Present indications are that protests against continuance of the rates will not be widespread. The chief opposition to maintenance of the surcharges at present comes from coal shippers, who also were one of the principal groups which opposed the surcharges when first requested. Protests from the iron and steel industry were few and were directed chiefly against surcharges on raw materials.

In its recent annual report, the commission said that there has been, on the whole, little complaint from the shipping public against payment of surcharges. Most complaints, the commission said, were against inequalities on competing articles. Nearly all of these, it pointed out, "when well grounded, have been corrected or are from time to time being corrected."

The railroads' petition for continuance of the surcharges said that they have not brought about any disturbance in business conditions and "that their continuance is absolutely necessary to enable the rail carriers to meet increased costs of operation."

Based on their operations for 1935, the railroads estimate that the addition to their payrolls amounts to approximately $160,000,000 annually, and that the increase in their operating expenses, resulting from the increased cost of materials and supplies over and above 1933 prices, amounts to approximately $100,000,000. It is estimated that this sum as income will be exceeded as the yield of the surcharges for the full year, April 18, 1935, to April 18, 1936.

Although there has been an increase in railroad traffic during the past few months, the petition says, the railroads had a net deficit of $25,128,000 for the first 11 months of 1935 and that the causes which brought about increased expenses will continue to operate in 1936. The petition states that operating expenses for 1936 will reflect the payment of the basic rates of pay of railroad labor unaffected by any reductions and the payment of the increased costs of materials and supplies.

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From the Soaking Pit

Dismissal of about 500 NRA employees on Feb. 1 is contemplated by the Department of Commerce which has taken over the remnant of the organization. . . . The field force of some 120 has recently been entirely abolished. . . . Of those scheduled for dismissal, about 250 have been "loaned" to other New Deal agencies and their ultimate discharge from Government services depends upon approval of the third deficiency bill which failed of passage at the prior session of Congress. . . . The NRA force, which had a peak of 5500 employees, now consists of about 1100 and the cutting off of 500 more therefore would reduce it to some 600. . . . The extended NRA act expires April 1. . . .

There are still some 795,000 on the Federal payroll, exclusive of relief or special agencies such as the CCC, and of this total 133,000 are associated with so-called emergency alphabetical agencies. . . . The growth of Federal bureaucracy was strikingly set forth by Representative Treadway, Republican, of Massachusetts, in an address before the House last week. . . . He presented figures showing that the Government now leases in Washington more than 100 buildings with 2,637,199-sq. ft. of floor space, at an annual rental of $2,548,872.45. . . . This is despite the huge new Government buildings that have been occupied since the New Deal came into power. . . . And when New Dealers first came to Washington they joked about the enormous Department of Commerce building, calling it Hoover's folly. . . . That was in the days when Government expenditures were to be reduced 25 per cent. . . . This now brings an ironical laugh. . . . Almost as big a laugh as the alibi members of Congress give for their practice of nepotism—that is of putting relatives on the payroll as Congressmen howl for distribution of the wealth. . . .

Representative Connery, Democrat, of Massachusetts, gets the painted palm for the ingenious, not to say ingenuous, alibi, quickly seized by others who would lose the aid of their relatives if Congress passed—which it distinctly will not pass—the bill of Representative Mitchell, Democrat, of Tennessee, to abolish nepotism. . . . Mr. Connery insists he must have the help of his brother as secretary in order to be insured against double crossing. . . . Millions of executives in the fields of industry, finance, transportation, publishing, etc., etc., etc., must now have tremors for fear of being double crossed by their secretaries who are not blood relatives. . . . And it might be well to look into the ancestry of the office cat. . . .

Reports are current that Major George L. Berry, industrial coordinator, displeased that he could make no go of his Council for Industrial Progress, is about to resign. . . .

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Iron and Steel Exports Rise 12 Per Cent

Rising 12 per cent, exports of iron and steel in 1935 aggregated 3,067,336 gross tons against 2,832,413 tons in 1934. Exceeding by 29,479 tons outgoing shipments in 1929, those of last year included 2,107,814 tons of scrap or 69 per cent of the total, an increase of 15 per cent of similar exports in the previous year.

Exports last December totaled 239,269 tons, an increase of 16.9 per cent over November but de-

clined 15.3 per cent under December, 1934. Scrap exports in December were 148,380 tons, or 56 per cent of the total, and showed a gain of 37,734 tons over November exports of old material.

For the entire year 1935 the Far East maintained its position as the leading market for American shipments, taking 1,413,519 tons or 46 per cent of the total, made up chiefly of scrap as were also shipments to Europe which took 28 per cent and shipments to North Central American countries and the West Indies, which took 18 per cent of the total movement of last year. Exports to South America showed a sharp decline, falling off 25 per cent to a total of 186,425 tons.

Tin plate represented the greatest shipments of finished lines last year with a total of 132,212 tons. Black steel sheets ranked second with a total of 100,483 tons.

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Metal Mining Bloc Protests Trade Agreements

As one of part of a five-point legislative program, the House metal mining bloc has adopted and forwarded to Secretary of State Hull a resolution protesting additional trade agreements under which any minerals or metals may be imported into the United States "where such minerals or metals are domestically mined." The resolution also urged that action be taken to modify agreements already negotiated. The resolution was sponsored by the American Manganese Ore Producers Association. The metal mining bloc is headed by Representative James G. Scrugham and consists of House members from nine Western States.

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Internal Strife in A. F. of L. Grows

Upon petition of the International Association of Machinists, the National Labor Relations Board has reopened its case involving a proposed election at the Portsmouth, Ohio, plant of the Wheeling Steel Corpn. It previously held a hearing at the request of the Amalgamated Association of Iron, Steel and Tin Workers. The machinists, however, asked that they also be allowed to be heard and apparently are seeking an election to be confined to their own craft, while the Amalgamated Association sought an election to determine a majority of all crafts in their union for the purpose of collective bargaining.

It was said at the board that the machinists, contrary to published reports, had not asked that machine repair and maintenance employees be prohibited from participation in an election. As yet no election has been ordered under the petition of the Amalgamated Association, but the board can, if it desires, divide workers within a plant among its crafts and hold one election or more. Denial also was made that the petition of the machinists is a reflection of the rift between craft and industrial unionists within the ranks of organized labor. The machinists' case will be heard Feb. 4.

Meanwhile the row of the craft-industrial issue has reached the boiling point. To the demand of the executive council of the American Federation of Labor at its Miami, Fla., meeting last week that John L. Lewis, a member of the committee for industrial organization, stop his activities to promote industrial unionism, Mr. Lewis has hotly retorted that he will not yield. If the council presses the issue its next step will be to lay it before the annual convention of the A. F. of L., and ask it to revoke the charter of unions whose officials are promoting the industrial union campaign This would include the United Mine Workers, of which Mr. Lewis is president, with a membership of some 400,000. Other such unions whose officials are participating in the campaign include textile and clothing. The industrial union affiliates of A. F. of L. have a membership of about 1,000,000 while craft union representation is about twice that number.

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Amalgamated Makes Charge Against J. & L.

The National Labor Relations Board has ordered a hearing to be held at Pittsburgh on Feb. 5 of the charges of discrimination filed by the Beaver Valley Lodge, Amalgamated Association of Iron, Steel and Tin Workers of America, against Jones & Laughlin Steel Corpn. C. S. Golden, regional director, charged that the company discharged 12 men at the Aliquippa plant and refused reinstatement because of alleged activities of the men in promoting the union organization.

Italy, hard pressed by sanctions, is being forced to import iron and steel products from countries which have never before sold such products to her. Recently Morocco shipped iron products to Italy to the value of 148,000 lira. Albania is exporting tools and steel products to her also.

Finds Wages Not Cut Since Demise of NRA

THERE has been no widespread tendency to cut wages, to increase hours of work, or to lay off employees since the National Industrial Recovery Act was suspended last May.

An analysis by the National Industrial Conference Board of the payroll records of about 2000 manufacturing plants in 25 industries, which employ more than a million workers, shows that hourly earnings and employment in October, 1935, were above those of April, the last month of NRA, and that the average working week was less than two hours longer. Much of the increases in hours reflects better business conditions, and in many industries the work week was still below the maximum set by the codes.

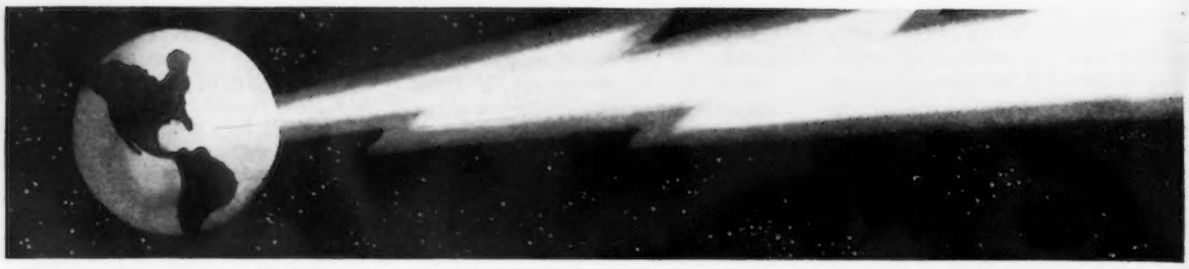
In 17 of the 25 industries, average hourly earnings were higher in October than in April; in seven industries they were less, and in one industry they were the same for the two months. Among the seven industries in which hourly earnings declined, in only one was the decline more than 1c.

Conklin Company Is 75 Years Old

THE T. E. Conklin Brass & Copper Co., Inc., New York, one of the leading independent distributers and warehousers of copper, brass and bronze products is celebrating the diamond jubilee of its founding in 1860.

Originally established by Jacob Hoppeck with an office on John Street and a rolling mill at Twenty-second Street and Second Avenue, the offices of the company are now located at 54-60 Lafayette Street where the company occupies three entire floors comprising 30,000 sq. ft. William B. Brown is president of the organization and recently celebrated his thirty-fifth year with the company.

Oilstones and abrasive specialties manufactured for more than 100 years under the name of Pike Mfg. Co., are now distributed by the Norton-Pike Co., through the New York Division of the Norton Co., Behr-Manning Corpn., Troy, N. Y. In new packaging the familiar "NORTON ABRASIVES" stands out prominently and a distinct color scheme indicates products and purposes.



NEWS OF THE WEEK

Scrap Iron Institute Studies Costs and Merchandising at Chicago Convention

EXCELLENT papers and well conducted discussion from the floor characterized the eighth annual convention of the Institute of Scrap Iron and Steel, held last week at Chicago. Particular prominence was given to the subjects of costs and merchandising, and highlights of the meetings were addresses by Walter S. Tower, executive secretary, American Iron and Steel Institute, and Dr. Max Gerber, formerly executive director of the Scrap Iron Association of Germany.

Based on approximately 50 returns, Michael V. Bonomo, Schiavone-Bonomo Corpn., New York, reported that the average cost of trucking, handling and preparing a ton of scrap, including overhead cost, in the scrap yards of the country, is $3.89. Average costs range from $2.75 per ton in the Chicago, Duluth and Northwest district, to $4.87 per ton in the Pacific district.

The types of scrap which are handled in the various districts and the relation of truck transportation to railroad transportation in the industry were also considered. It is quite evident that these factors create a difference in costs and in methods of operation. It would seem that on the average for the country, the yard dealers handle 37 per cent No. 1 steel scrap, 34 per cent No. 2 steel scrap, and 20 per cent cast iron scrap. It would also appear from the figures that, on the average for the country, the incoming scrap to the yards is divided as follows: 31 per cent incoming by railroads and 55 per cent incoming by trucks; the outgoing scrap is divided, 77 per cent outgoing scrap by railroads and 15 per cent outgoing scrap by trucks.

Mr. Bonomo then submitted the cost of preparing scrap in his Jersey City yard for the year 1935, as shown in the following tabulation:

Summary of Cost Data for Jersey City Yard

Percentage of scrap received by Railroad 3%
Percentage of scrap received by our Trucks 57%
Percentage of scrap shipped by Railroad 13%
Percentage of scrap shipped by our Trucks 85%

Percentage of Material Handled

No. 1 Steel 45%
No. 2 Steel 19%
Cast Grades 23%

Analysis of Costs at Jersey City Yard

Trucking Cost, including material received by his trucks and shipped by his trucks, consisting of drivers' and helpers' wages, truck hire, automobile operating expenses, insurance and depreciation on automobiles, $1.04 per gross ton

Preparation Cost of material handled in yard, consisting of wages, repairs and supplies, power, oxygen, acetylene, maintenance, compensation insurance, and insurance and depreciation on machinery and equipment .....$1.62 per gross ton

Overhead Expenses, consisting of office salaries, travel, advertising, telephone, stationery, association dues and subscriptions, heat, professional fees, watchman, general insurance, taxes, rent, depreciation and bad debts .....$0.50 per gross ton
Total .....$3.16 per gross ton

Further Analysis of Costs at Jersey City Yard

Traveling Expense..$0.03 per gross ton
Advertising ..... .11 per gross ton

Analysis of Scrap Costs by Districts

District	Cost of Trucking	Cost of Handling and Preparing	Overhead Cost	Total Cost
New England	$1.30	$1.87	$0.41	$3.58
Middle Atlantic	1.07	1.45	.92	3.44
South Atlantic and Gulf	1.50	1.85	1.25	4.59
Pittsburgh and Valleys	1.25	1.89	.81	3.94
Detroit and Cleveland	1.25	2.46	.58	4.29
Chicago, Duluth and Northwest	.75	1.44	.56	2.75
St. Louis and Kansas City	.80	2.40	.46	3.66
Pacific Coast	1.62	1.75	1.50	4.87

A SYMBOL OF A DEFINITE STANDARD OF WORTH

THE CINCINNATI MILLING MACHINE CO.
CINCINNATI GRINDERS INCORPORATED
CINCINNATI OHIO

MILLING MACHINES GRINDING MACHINES
LAPPING MACHINES BROACHING MACHINES

Wages	1.36 per gross ton
Truck Expense	.37 per gross ton
Repair & Maintenance Plant	.20 per gross ton
Power & Equipment	.07 per gross ton
Oxygen	.13 per gross ton
Actylene	.06 per gross ton
Professional Fees	.02 per gross ton
Telephone and Telegraph	.02½ per gross ton
Office salaries	.11 per gross ton
Stationery and printing	.01½ per gross ton
Light and heat	.01 per gross ton
Contribution and association dues	.01 per gross ton
Rent	.04 per gross ton
Insurance	.33 per gross ton
Taxes	.04 per gross ton
Depreciation on buildings, plant, equipment and trucks	.22 per gross ton
Provision for bad debts	.01 per gross ton
Total overhead expenses	$3.16 per gross ton

These cost figures do not include salaries or drawings for the proprietors.

Sales were subject to deductions for:

Shortage	$0.04 per gross ton
Rejection	.01½ per gross ton
Demurrage	Fraction
Waste and dirt	.10½ per gross ton

Cost of Baling

Cost of handling and baling light scrap was reported by Morris Machlin, Machlin Brothers, and Bassow, Inc., New York. His figures were based on old material, cars spotted at the side of the press, labor at 60c. an hr. and these figures including sorting labor. The total cost, not including the scrap, is $3.07 per ton when operating at 70 per cent of capacity. The break down is labor, 85c.; repairs and maintenance, 30c.; power, 35c.; compensation insurance, 18c.; depreciation, 40c.; advertising and association dues, 2c.; office expense, 8c.; watchmen, 6c.; rent, 20c.; administration, 50c.; office salaries, 10c., and fire and machinery insurance, 3c.

Large Tonnage Days Over

The day of large tonnages is over, said Joseph E. Jacobson, Luria Brothers & Co., Pittsburgh. The present-day broker regards a 5000 or 10,000-ton order as a large tonnage. There are numerous buyers who prefer to purchase their scrap as it is accumulated at prices previously agreed upon. There are other buyers, who, upon receipt of large customer orders, wish to cover for an equal tonnage of the required scrap. These accounts are serviced also and it is only natural that the seller demand what he considers a fair price for the merchandise. The consumer has been educated to the inescapable fact that by creating a large shortage for his delivery, he is likewise creating higher prices for his subsequent requirements.

DARWIN S. LUNTZ, the new president of the Institute of Scrap Iron and Steel, is head of the Luntz Iron & Steel Co., Canton, Ohio, and has been in the scrap iron business 24 years. He founded the Luntz company in 1916. He is serving his second term as president of the Canton Chamber of Commerce and the Stark County Planning Commission. He recently sponsored and organized the Civic Affairs Commission of Canton.

Scrap price has no relationship to pig iron price from the angle of fixed value, but is variable and changes according to the rise and fall of ingot production rather than according to its relative value to pig iron. In point of actual value most open-hearth technicians figure, using pig iron as a 100 per cent commodity, that No. 1 heavy melting steel is worth 105 per cent from the standpoint of yield of metal. Figuratively then, with pig iron today at $19, Valley, scrap is now worth $19.95, Valley—and is actually selling at about 75 per cent of that figure.

Again the difficulty of ascertaining the value of scrap to each individual mill must be borne in mind—a mill possessing blast furnaces naturally figures that the top price it could pay for scrap is not based on the selling price of pig iron, but on the cost price. To a mill not possessing blast furnaces, the relative value of heavy melting steel must be figured from the point of cost of purchased pig iron. Thus, when scrap passes the cost figures of pig iron in price, certain self-contained mills decrease the use of heavy melting steel, leaving a freer floating supply for the mills that are not self-contained. Even then oftentimes scrap continues to rise in price because of a shortage of supply, but when it crosses the selling price of pig iron, wise observers begin to be cautious in their commitments.

Steel Industry Linked With Scrap

The strength of the steel industry depends on its ability to find and hold customers and it follows that those who are directly or indirectly concerned with the steel industry have a stake in the industry's markets. This pertinent fact was stated by Walter S. Tower, executive secretary of the American Iron and Steel Institute.

He went on to say that few great industries have ever remained in a static condition for any considerable period of time. It is in the nature of human activities that there shall be either progress or retrogression. And the steel industry is no exception to the rule. Its methods of production change, character of demand varies, and nature of its products must keep pace if the industry is to hold its place in the dynamic and highly competitive economic structure of a country like the United States. If old customers disappear, others must be found to take their places. If there is to be continued growth or healthy and strong progress in an industry, old customers must use more of its products or new customers and new uses must be added. But old or new, the customer's needs must always be satisfied.

It is easy to see how the requirements of customers are bound to have an important effect on the at-

Analysis of Types of Scrap and Method of Transportation

District	No. 1 Steel Scrap	No. 2 Steel Scrap	Cast Iron Scrap	Incoming Scrap by Railroads	Incoming Scrap by Trucks	Outgoing Scrap by Railroads	Outgoing Scrap by Trucks
New England	27%	32%	25%	7%	75%	50%	10%
M. Atlantic	36%	21%	33%	13%	58%	32%	53%
S. Atlantic, etc.	25%	55%	16%	45%	39%	82%	12%
Pittsburgh, etc.	42%	23%	18%	29%	68%	96%	4%
Detroit, etc.	44%	25%	16%	15%	66%	79%	15%
Chicago, etc.	40%	34%	22%	43%	39%	96%	4%
St. Louis, etc.	50%	30%	15%	75%	16%	92%	8%
Pacific Coast	35%	53%	12%	17%	81%	85%	15%

titude of the steel maker toward the character of materials used in manufacturing any product which must conform to rigid requirements in chemical analysis. As large suppliers of materials, the scrap industry has a close collateral interest in these problems that customers present to the steel industry.

Alloys Enter Picture

It is still probably too early to hazard a guess, according to Mr. Tower, about the extent to which alloy, stainless and high tensile steels will change the course of the industry, although there are some who profess to see them dominating the future uses of steel. In all such types of steel, the customer requires, and the maker must conform to, very exact limits as to the amount of any of the alloying materials contained in the finished product. It is difficult, if not impossible, to make steel of such descriptions with a haphazard use of raw materials. There must be complete and exact knowledge of what goes into the melt if there is to be full control of what qualities the finished steel is to possess.

In connection with these changes in the attitude of customers of the steel industry toward the kind of product which they need, it may be noted that in many cases the improved quality is being furnished at no higher price, in some cases even at a lower price, than was received for the product of poorer quality some years ago.

New Markets Opened

"Formerly," said Mr. Tower, "the industry was accustomed to think of its customers as constituting the few thousands of fabricators or manufacturers who purchased steel, from which to make finished articles. Now the industry is beginning to look beyond those fabricators to the markets beyond, to the millions of people in the country who, in the final analysis, make the market for steel. These are the ultimate consumers, the people of the nation who, in their striving for, and attainment of, higher standards of living, will use and benefit from the things made of steel.

"The gradual introduction of more steel into houses, for example, may mean for a time a lessened speed in the circulation of the material, from the furnace, through the hands of some user, and back to the furnace. Steel going into dwellings certainly cannot be expected to return as scrap as soon as automobile steel, although ultimately it may appear on the market in even greater quantities.

"If the steel industry succeeds in developing, in the near future, large new consuming markets—if its operating rate and its annual tonnage are stepped up to a point substantially above today's levels—many of the problems which confront the scrap industry will automatically be solved.

"After surveying the changes that have been taking place in the steel industry within recent years, it becomes plainly apparent that the markets for steel are much more varied and customers are correspondingly more numerous than they formerly were. The effect of this broadening of the consuming markets has been to broaden and strengthen the base upon which the industry stands."

Plan of Compensation Insurance

Benjamin Schwartz, executive secretary of the institute, offered a plan of compensation insurance that will be open to members only, and that will not be compulsory. It is designed primarily to reduce the

Streamlined Milk Car Makes Debut

MILK cars are now being streamlined and converted from wooden to steel construction with a weight saving of 3 net tons per car. The illustration shows a new steel-sheathed car standing beside a standard wooden passenger car type milk car. The new car was converted from a wooden car of the type shown. The old car weighed approximately 90,000 lb., and the new steel-sheathed car weighs 84,000 lb.

In reconstructing the car, the old glass-lined steel tanks were retained, but the old wooden floor was replaced by a new steel floor. The tanks were raised sufficiently to allow the laying of 4 in. of cork insulation on the floor. Rolled channel members, extending over the tops of the tanks and lying in to the underframe, were used to brace and stiffen the tanks and also as a framing into which to insert 4 in. of cork insulation around the tanks and to support the outside sheathing.

The sheathing, consisting of No. 10 gage black sheets, was welded to the channel members. The welds were then ground, following which the entire sheathing was sandblasted. For the final finish the sheathing was sprayed with two coats of molten zinc, followed by two coats of molten aluminum.

The car was converted by the Borden Farm Products Co., Inc., in its own shops in the Erie Railroad yards at Jersey City, N. J. Two other cars are now in process of being streamlined, and a total of 60 cars are to be converted.

cost of insurance and to place insurance on a cost plus basis. Concurrent with the plan there is to be an educational campaign on safety and good engineering practice. The idea is to form a self insurance fund, but to participate each dealer must first qualify under his State laws and regulations.

The proposition is to pay into the pool 80 per cent of present premiums, a net saving at the start of 20 per cent. The 80 per cent paid in can be arranged on the installment plan. Stop loss policies are being arranged with Lloyds so the dealer will be liable only to the amount he puts into the pool.

Insurance rates have been steadily climbing and now average for the country $15 per $100 of payroll. It is hoped that when the new plan is placed on a cost plus basis the present rates can be cut far more than the initial 20 per cent.

New Officers of Institute of Scrap Iron and Steel

President

Darwin S. Luntz, president, The Luntz Iron & Steel Co., Canton, Ohio.

Vice-President

Michael V. Bonomo, Schiavone-Bonomo Corpn., New York.

Secretary

Walter Erman, Erman, Howell Co., Chicago.

Treasurer

Thomas F. Kelly, Brooklyn.

Executive Secretary

Benjamin Schwartz, New York.

New Directors

Richard V. Bonomo, L. Schiavone-Bonomo, Jersey City, N. J., president, New Jersey chapter.

Percy W. Bowers, P. W. Bowers & Co., New York, president, New York chapter.

David H. Cohen, D. H. Cohen, Inc., St. Louis, president, St. Louis chapter.

Harry Cohen, H. Cohen & Co., Chelsea, Mass., president, Boston chapter.

John Hunt, M. J. Hunt's Sons, Philadelphia, president, Philadelphia chapter.

Sloan Hurwitz, Hurwitz Brothers Iron & Metal Co., Buffalo, president, Buffalo chapter.

Ben Kaplan, M. S. Kaplan Co., Chicago, president, Chicago chapter.

Maurice Schlafer, Schlafer Iron & Metal Co., Detroit, president, Detroit chapter.

I. Guy Shapiro, Columbia Iron & Metal Co., Cleveland, president, Cleveland chapter.

I. W. Solomon, I. W. Solomon Co, Pittsburgh, president, Pittsburgh chapter.

J. B. Knight, J. T. Knight & Son, Inc., Columbus, Ga., president, Southern chapter.

Maurice Friedman, M. D. Friedman Co., Ashland, Ky.

Phil W. Frieder, Phil W. Frieder Co., Youngstown.

Joel Claster, Luria Brothers & Co., Philadelphia.

William J. Ross, Hyman-Michaels Co., Chicago.

Louis J. Borinstein, A. Borinstein, Indianapolis.

David Pollock, Mayer-Pollock Co., Pottstown, Pa.

Barney H. Rubine, Hudson Iron & Metal Co., Bayonne, N. Y.

Scrap An International Commodity

The international importance of the scrap industry was pointed out by Dr. Max Gerber, former executive director of the Scrap Iron Association of Germany. He said, not only governments and the authors of the Versailles Treaty recognized the international importance of scrap, but even the World Economic Conference which was held a few years ago in London and, last but not least, the League of Nations, have given scrap quite some attention.

During and after the World War a number of countries (Japan, Russia, Poland and Italy) enlarged their steel industries and stepped up their production enormously. None of these countries accumulates scrap iron in an amount sufficient to keep their mills supplied and therefore they had, and still have, to resort to the importation of scrap. As a result, other countries find a ready and welcome outlet for their surplus and for those large quantities of scrap which cannot be shipped to domestic mills on account of prohibitive cost of transportation. Thus, scrap becomes a world commodity and all signs seem to indicate that the international importance of scrap through export and import has by far not reached the top.

In what large measures this is already the case today follows from the fact that American scrap iron was exported last year to over 30 countries, that in 1934 Germany imported scrap iron from 35 countries and exported to 18 countries.

As far back as 32 years ago the first scrap iron organization was established in Germany, the fundamental principles of which have remained unchanged to this very day. This organization which comprises a great number of steel mills, has chiefly two functions; to purchase open-hearth steel scrap for joint account of its members and to allocate the material to the mills according to the most favorable freight rate. The steel mills must make all their purchases of open-hearth steel scrap through the association and keep it informed of their requirements. On the other hand, the organization has an agreement with a number of dealers according to which the dealers must offer all their open-hearth steel scrap to the organization.

This method automatically eliminates direct dealing between mills on one hand and railroads and other large producers of scrap on the other hand. The steel mills make payment for the purchased material to the organization which, in turn, pays the dealers. Uniform standard specifications help greatly toward lessening arguments between the mills and the dealers. In case of rejections, arguments are, as a rule, settled by a disinterested, official expert and sometimes by the organization directly. Until a few years ago, the association also had the right to fix prices which are binding on all dealers. Since the beginning of the new German economic regulations, however, it was deprived of its former independence and the government expressly reserved the control of prices for itself.

The total quantity of scrap which in 1935, flowed between all countries, amounted to approximately 4,000,000 tons which is about twice as much as in 1930 and about three times as much as in 1932. The international flow and character of this large scrap trade can be seen from the scrap exports in 1934 of the following principal countries; the relative position of the leading exporters of scrap can also be seen from these figures:

	Tons
United States	1,864,933
France	620,626
Belgium	337,268
Netherlands	269,147
Great Britain	226,533
Germany	94,553

The share of the United States in world scrap trade was only 20 per cent each in 1930 and 1932, while in 1935 it contributed more than one-half of the entire scrap exports. There can be no doubt but that America today is the center of the international scrap trade and will remain in this predominant position for many years to come.

Steel Corporation Earnings Rise Appreciably in Fourth Quarter

EARNINGS of the United States Steel Corpn. in the fourth quarter rose appreciably above those of the preceding three quarters of 1935. Earnings in the quarter ended Dec. 31, after deducting ordinary repair and maintenance expenses and taxes, amounted to $20,418,435. Comparable figures for the third, second, and first quarters were $13,469,570, $14,117,864, and $12,428,429. As in previous quarters the board of directors voted a ½ per cent, or 50c., dividend on the preferred stock. The dividend is payable Feb. 28, 1936, to stockholders of record Jan. 30, 1936.

Charges and allowances for depreciation, depletion, and obsolescence in the fourth quarter amounted to $12,869,579, leaving a net income of $7,548,856. Interest charges on outstanding bonds and mortgages totaled $1,225,710, leaving net income from operations of $6,323,146. Deductions for overhead expenses (of which taxes comprise substantially the greater part) of the Lake Superior iron ore properties and the Great Lakes transportation service left a balance for the quarter of $4,783,868.

Shipments of finished steel products for the fourth quarter totaled 2,030,076 tons, compared with 1,787,224 tons in the third quarter, 1,768,751 tons in the second quarter, and 1,785,248 tons in the first quarter. The year's shipments were 7,371,299 tons.

The corporation's earnings for the year ended Dec. 31 amounted to $60,434,318, after deducting ordinary repair and maintenance expenses and taxes. Charges and allowances for depletion, depreciation and obsolescence during the year came to $47,212,891. Interest charges on outstanding bonds and mortgages totaled $4,959,780, leaving net income from operations of $8,261,647. Deductions for overhead expenses of the Lake Superior iron ore properties and the Great Lakes transportation service left a balance for the year's operations of $542,368.

Empire to Make Tin Plate and Long Ternes

THE Empire Sheet & Tin Plate Co., Mansfield, Ohio, since its reorganization from the Empire Steel Corpn., has made a considerable investment in new equipment and modernization of its property.

In the past few weeks Empire has been installing equipment for the manufacture of the tin plate and long ternes. At the present time the long terne unit is in full production and by Feb. 1 the new machinery will be completely installed ready for full production of tin plate.

One entire sheet plant has been renovated for the installation of the newest and most modern equipment for the making and processing of tin plate. This is the original plant on the Mansfield property. In so converting this tonnage to tin plate, it will eliminate that share of tonnage from the sheet market, in view of the fact that this plant has been operated at capacity.

Empire will supply the trade with a type of tin known as "Pack Tin," because of the fact that the sheet bar will be converted by hand mill practice on the hot mills. The seven stands of hot mills, now in operation, are equipped for tin plate production only. In the past Empire has marketed tin mill black grades. The new installation will convert the entire plant to tin plate tonnage. The hot mills will be supplied with continuous pair and sheet furnaces. Other installations include new pickling and annealing equipment, along with three-stand tandem cold rolling facilities. Sufficient coating equipment has been installed to process the amount of tonnage to be produced.

A new warehouse and shipping department has been constructed, and is provided with a temperature controlled heating unit installed to maintain constant temperature. With the facilities that Empire offers in this unit, there will be an annual capacity of 500,000 base boxes.

Allegheny to Erect Barge Terminal

THE Allegheny Steel Co., Brackenridge, Pa., has acquired an extension to its plant site on the Allegheny River for the erection of a modern barge-loading terminal. Growth of the company's shipments to down river points, according to W. F. Detwiler, executive vice-president, has created a volume of river freight which the new terminal will handle with increased efficiency.

The increase of more than 300 per cent in the number of the company's customers in the last four years, declared Mr. Detwiler, has opened numerous markets, many being on or near the Ohio and Mississippi Rivers. The company also is receiving much raw material by water. The terminal site just acquired is within 200 yards of the Allegheny furnaces, and the company's present railroad spur has been extended to it to make a rail-and-water terminal.

Virginia Bridge Is Acquired by Tennessee

THE Tennessee Coal, Iron & Railroad Co., Birmingham, has acquired the properties of the Virginia Bridge & Iron Co., Roanoke, Va., which has fabricating plants at Roanoke, Memphis, Tenn., and Birmingham. On Jan. 23, stockholders of the Virginia company approved the sales agreement made by the board of directors on Dec. 27, after which the following statement was issued by John L. Perry, president of the Tennessee company:

"Tennessee Coal, Iron & Railroad Co. announces that it has contracted to purchase the fabricating plants of the Virginia Bridge & Iron Co., located at Birmingham, Roanoke, Va., and Memphis.

"This acquisition enables the Tennessee Coal, Iron & Railroad Co., located and operating in Southern territory, to maintain its position in the market for fabricated steel. Title to the properties acquired will be placed with the Virginia Bridge Co., a wholly owned subsidiary of the Tennessee Coal, Iron & Railroad Co. The operations of acquired properties will be conducted by the Virginia Bridge Co."

The new management will continue to operate all three fabricating plants.

Continental Oil Co. has let the contract to the Apex Construction Co. for oxy-acetylene welding of 45 miles of 8-in. line from Lake Charles to Basile, La., in conjunction with previously reported 6-in. line, both lines in same ditch. Work begins this week.

Foundry Association To Emphasize Safety

WITH a view to making more effective the work the American Foundrymen's Association has carried on for a number of years on plant safety, good housekeeping and protection of foundry workers, a safety and hygiene section has been organized to accomplish the following purposes:

To determine further the extent of hazards to safety and health in the foundry industry; to study causes of hazards and methods of prevention, and to provide further protection to workers against exposure.

Cooperation with other centralized agencies of industry confronted by similar problems, in assembling and making available information on this subject.

Cooperation with public health agencies, insurance carriers, and the medical profession in forwarding health measures.

Assisting in standardization of dust elimination equipment and improvement of shop operating conditions in the foundry industry through active educational work.

Promoting standards for dust elimination and control equipment, in cooperation with agencies of the manufacturers of such equipment.

Giving encouragement by active means where enactment of equitable and fair compensation laws is sought in industrial States.

E. O. Jones, for many years associated with Belle City Malleable Iron Co., Racine Steel Casting Co., Racine, Wis., and for the past three years consultant of industrial relations bureau of the National Founders' Association, has been made director of the safety and hygiene section, and will have his office at the headquarters of the American Foundrymen's Association, 222 West Adams Street, Chicago.

THE condition of blast furnaces in the United States is interestingly shown in the accompanying tabulation prepared by Arthur G. McKee & Co., Cleveland, and based on data taken from the most recent Iron and Steel Works Directory of the American Iron and Steel Institute. It is shown that the rebuilding of furnaces has almost entirely stopped in the last five years and that only 63 stacks, with an annual capacity of 13,117,000 gross tons, have been relined. This tonnage represents only 25.1 per cent of the industry's pig iron making capacity. In the preceding five-year period, however, 150 stacks, with a capacity of 31,629,000 tons or 60.1 per cent of the country's capacity, were relined. The tabulation indicates very clearly the large potential demand for refractory materials and other blast furnace equipment and supplies.

Summary by Years Showing When Blast Furnaces in the United States Were Last Relined and Rebuilt (or Built)

Year Last Rebuilt or Built	Number of Furnaces	Rated Annual Capacity	Average Annual Capacity per Furnace	Production Pigiron and Ferro-alloys	Year Last Relined	Number of Furnaces	Rated Annual Capacity	Average Annual Capacity per Furnace
1935	2	599,000	299,500		1935	2	550,900	275,450
1934	3	656,520	218,840	15,676,839	1934	18	3,284,500	182,472
1933	3	804,000	268,000	13,000,719	1933	21	4,292,320	204,395
1932	2	604,200	302,100	8,781,453	1932	7	1,352,800	193,257
1931	5	1,249,900	249,980	18,426,354	1931	15	3,637,030	242,466
1930	13	3,603,760	277,212	31,752,169	1930	37	8,000,810	216,237
1929	12	3,334,180	277,848	42,613,983	1929	37	8,179,530	221,067
1928	17	3,823,800	224,929	38,155,714	1928	35	7,481,960	213,770
1927	9	2,687,300	244,300	36,565,645	1927	27	5,644,420	209,052
1926	14	3,104,540	221,752	39,372,729	1926	14	2,322,240	165,878
1925	14	2,712,550	193,753	36,700,566	1925	9	1,526,650	169,627
1924	19	3,890,000	204,737	31,405,790	1924	15	2,765,050	184,336
1923	6	1,242,150	207,025	40,361,146	1923	3	401,000	133,666
1922	5	1,058,730	211,746	27,219,904	1922	1	210,000	210,000
1921	6	1,115,200	185,866	16,688,126	1921	2	228,000	114,000
1920	9	1,753,250	194,805	36,925,987	1920	2	312,000	156,000
1919	10	1,771,950	177,195	31,015,364	1919	1	198,300	198,300
1918	9	1,878,950	208,772	39,054,644	1918	1	120,000	120,000
1917	10	2,147,650	214,765	38,621,216	1917	1	60,000	60,000
1916	6	1,274,000	212,333	39,434,797				
1915	5	923,200	184,640	29,916,213		248	50,567,510	
1914	5	841,500	168,300	23,332,244	No record	10	1,563,770	
1913	3	780,000	260,000	30,966,152				
1912	4	304,700	76,145	29,726,937				
1911	6	956,100	159,350	23,649,547	Total	258	52,131,280	
1910	4	852,750	213,187	27,303,567				
1909	6	1,272,600	212,100	25,795,471				
1908	8	1,274,200	159,262	15,936,018				
1907	5	573,250	114,650	25,781,361				
1906	1	241,500	241,500	25,307,191				
	221	47,331,430						
No record or built or rebuilt before 1906	37	4,799,850						
Total	258	52,131,280						

PERSONALS

ROY H. NODERER has been appointed manager of the metallurgical department, Lorain division, Carnegie-Illinois Steel Corpn., Johnstown, Pa. After attending Oberlin College, he was employed by National Tube Co. at Lorain, in the chemical laboratory in 1903. He started with the Lorain Steel Co. as chief chemist in 1910, and from 1926 to date he has served as metallurgist. He is a member of the American Society for Testing Materials, American Welding Society, American Society for Metals and American Foundrymen's Association.

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R. B. SCHENCK, for the past 15 years chief metallurgist, Buick Motor Co., presented a paper on "Metallurgy and Transmission Gears," at the production session of the annual meeting of the Society of Automotive Engineers in Detroit recently. He discussed the forging, annealing, hardening, drawing and the physical properties of gear steels, including a brief description of an improved method of hardening now being developed. Before joining the Buick company Mr. Schenck was associated for five years with the United States Steel Corpn.

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CRESCENT G. MEDLEY, since 1934 Youngstown district sales manager for the Republic Steel Corpn., will continue in charge of that office now that the main office of the company has been moved to Cleveland. He has been connected with the steel industry for about 10 years.

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S. E. LAUER, general sales manager of the York Ice Machinery Corpn., York, Pa., has been elected vice-president in charge of sales.

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JAMES K. DIAMOND, heretofore vice-president and general superintendent of the Clipper Belt Lacer Co., Grand Rapids, Mich., has been elected president and general manager. RUSSELL J. CONN has been made vice-president and WILLIAM J. MERVENNE, treasurer and assistant manager.

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S. D. WILLIAMS, who has been identified with the Timken Steel & Tube Co., Canton, Ohio, since 1926, has been promoted to the position of director of sales. He started with the company as metallurgical sales engineer, later served as assistant director of sales for several years and in 1935 was made manager of tube sales.

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JAMES CLEARY, formerly Western manager and general sales manager of the Combustion Engineering Co., has been appointed special representative in the power equipment division of the Foster Wheeler Corpn., New York.

chief chemist and metallurgist, Deere & Co., Moline, Ill., has been nominated for vice-president. Nominations for directors to serve for three years are: MARSHALL POST, vice-president, Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.; L. N. SHANNON, vice-president and production manager, Stockham Pipe & Fittings Co., Birmingham; JAMES R. ALLAN assistant manager, industrial engineering construction department, International Harvester Co., Chicago; C. C. GIBBS, president, National Malleable & Steel Castings Co., Cleveland, and DAN M. AVEY, ditor, *Foundry*, Cleveland.

R. H. NODERER

R. B. SCHENCK

C. G. MEDLEY

W. L. REINEKE has been made Chicago district manager of the Aluminum paint division of Aluminum Industries, Inc., Cincinnati. He will cover North and South Dakota, Minnesota, Wisconsin. Iowa, Illinois, Michigan, Indiana and all of Ohio, exclusive of Cincinnati. He will make his headquarters at 616 South Michigan Avenue, Chicago.

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L. M. GRAHAM has been made sales director of the Cooley Electric Furnace Co., Indianapolis, Ind.

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JAMES L. WICK, JR., president and general manager, Falcon Bronze Co., Youngstown, has been nominated for president of the American Foundrymen's Association for the years 1936-37. Mr. Wick at present is vice-president of the association and has long been active in its work. H. BORNSTEIN,

FRED R. DANIELS, rejoined the Waterbury-Farrel Foundry & Machine Co., Waterbury, Conn., Jan. 1, as publicity manager.

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M. A. CUDLIP has resigned as vice-president and secretary of the Packard Motor Car Co. to go into business for himself. He has been with the company nearly 18 years.

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L. A. WHITCOMB, who has been sales engineer for the Carnegie-Illinois Steel Corpn. in the Cleveland district office, has been transferred to Pittsburgh and JAMES H. DUFF, who has been connected with the rail and special engineering departments of the company's main office in Pittsburgh, has been transferred to the Cleveland district sales office.

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C. A. RICHARDSON, of the United Engineering & Foundry Co., Pitts-

burgh, spoke before the St. Louis Welding Society on Jan. 17, on the subject of, "Management of Welding Costs."

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CLARENCE B. RANDALL, vice-president in charge of raw materials for Inland Steel Co., has been named a trustee of the University of Chicago.

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HARRY F. LEPAN, who has been identified with the Wilson & Bennett Mfg. Co., Chicago, for the past 14 years, has been named general sales manager. IRA FLATT, who has been with the company for 14 years, and has gone up through the organization from a clerk's position, has been named general factory manager.

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FRANK J. LUNNEY, formerly with J. N. Moyer, has established his own business at 953 North Front Street, Philadelphia, to deal in metal stamping presses and other metal-working machinery.

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DR. NORMAN A. SHEPARD, since 1919 director of the research laboratories of the Firestone Tire & Rubber Co., has been appointed director of technical service for the American Cyanamid Co., New York. He will be responsible for directing the technical service laboratories in Stamford, Conn., and the expansion of the sales service laboratories.

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GEORGE H. BOUCHER, formerly assistant general sales manager of the Pyrene Mfg. Co., Newark, N. J., has been made general sales manager. CHARLES G. DURFEE, who has been manager of the systems department, has become assistant to the vice-president in charge of sales. J. P. MALONEY, formerly assistant general sales manager, has been named general field sales manager.

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R. C. BROWER, secretary-treasurer, Timken Roller Bearing Co., Canton, Ohio, has been elected a director to fill the vacancy created by the death of J. C. OBERMIER.

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WALTER KAUFFMAN, credit manager of the Youngstown Sheet & Tube Co., Youngstown, will retire on Feb. 1, after having been in business for 55 years, 27 of them with the Sheet & Tube company. JOSEPH B. SUGDEN, assistant treasurer, will take up Mr. Kauffman's duties.

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O. L. PRINGLE has been appointed general manager of operations, Columbia Steel Co., with headquarters at San Francisco, succeeding W. R. PHIBBS, resigned.

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E. M. BARBER has been appointed general superintendent of the Torrance, Cal., plant of the Columbia Steel Co., succeeding B. W. LANZ, resigned.

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WALTER S. MACNABB, heretofore assistant to general superintendent of the Gary, Ind., works of the Carnegie-Illinois Steel Corpn., has been appointed superintendent of industrial relations in that plant.

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GEORGE P. WARDLEY, heretofore management's representative at South Works, Carnegie-Illinois Steel Corpn., South Chicago, Ill., has been appointed superintendent of industrial relations in that plant.

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NEIL H. JENKINS, formerly in the Chicago office of the purchasing department of the Carnegie-Illinois Steel Corpn., has been appointed editor of *Steel Columns*, an employees' magazine for the Chicago district plants of the company which is to publish its first issue next month.

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DAVID S. WRIGHT, who has been for a number of years with the Inland Steel Co. in the department of inspection and metallurgy at Indiana Harbor works, has been added to the St. Paul sales office of the company.

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WILLIAM J. FITZGERALD, formerly with the Paper Calmenson Co., St. Paul, Minn., has joined the Joseph T. Ryerson & Son, Inc., organization. He will be located in Minneapolis and will cover Minnesota, North Dakota, South Dakota and Montana in the interests of the company's reinforcing, fabricating and building products division. He was identified for eight years with the Truscon Steel Co.

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LOUIS JORDAN, who has had a long experience as chief of section on thermal metallurgy and assistant chief of the division of metallurgy, National Bureau of Standards, Washington, has been appointed secretary of the Institute of Metals Division and secretary of the Iron and Steel Division of the American Institute of Mining and Metallurgical Engineers, effective Feb. 1.

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L. A. SCHLUETER, manager of the Koppers Products Co. plant at Carrollville, Milwaukee County, Wis., has been transferred to the production department of the main office in Pittsburgh. He will be succeeded on Feb. 1 by G. E. TRAUT, at present manager of the Koppers plant at Utica, N. Y.

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JOEL C. CARPENTER has joined the technical staff of Battelle Memorial Institute, Columbus, Ohio. Since his graduation from Case School in 1929 Mr. Carpenter has been engaged in non-ferrous metallurgical research principally in the plants of the Chase Brass & Copper Co. He has been assigned to the division of process metallurgy at Battelle.

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ALFRED BOYLES, for 10 years metallurgist with the Tennessee Coal, Iron & Railroad Co., has recently joined the staff of Battelle Memorial Institute. Mr. Boyles attended the University of North Carolina. He has been assigned to the Institute's staff working on problems for the iron and steel industry.

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WILBUR H. BACHMAN, a graduate of Ohio State University, has recently joined the staff at Battelle. Mr. Bachman has been assigned to the division of physical metallurgy.

Lecture on Steel Dams In New York Feb. 4

OTIS E. HOVEY, consulting engineer, New York, will address the American Welding Society, American Society of Civil Engineers and American Water Works Association, at 8 p. m. on Tuesday, Feb. 4, in Room 501, Engineering Societies Building, 29 West Thirty-ninth Street, New York, on the subject of "Steel Dams." F. H. Frankland, chief engineer of the American Institute of Steel Construction, will preside.

As engineer for the American Bridge Co., Dr. Hovey has had many years of experience in the designing of steel structures. Last year he compiled for the American Institute of Steel Construction a text book on the design and erection of steel dams which brought together the latest technical information on this subject.

A new stainless steel works with an estimated capacity of 30,000 tons will be built in Norway in 1936. Raw materials will be obtained from Russia. It is rumored that German-American interests are behind the enterprise and it is said that a large market has already been secured in Germany.

OBITUARY

HENRY B. RUST, chairman of the board of the Koppers Co., Pittsburgh, and for many years its president, died at his home in Pittsburgh, Jan. 17, aged 63 years. He received his formal education in the public schools of Virginia and completed his education by private study. At the age of 17 he went to Pittsburgh and took a job as axman on an engineer corps in the employ of the city. Four years later he was made assistant city engineer. In 1900 he was made superintendent of construction for the Colorado Fuel & Iron Co. and had charge of the erection of the company's Pueblo, Colo., plant. Two years later he returned to Pittsburgh as vice-president and general manager of the Rust Boiler Co., which had been organized by his brother, Edwin G. Rust. Five years later, when the business was sold to the Babcock & Wilcox Co., Mr. Rust continued his association with the Babcock company for the following five years. In 1914, with H. W. Croft and Hamilton Stewart, Mr. Rust developed a plan for the purchase of the H. Koppers Co., then a comparatively small engineering and constructing company, engaged in the designing and building of parts of by-product coke plants under patents of H. Koppers. This business was taken over the latter part of 1914 and Mr. Rust was made president. The company was moved to Pittsburgh and since that time has had a phenomenal growth. Mr. Rust, throughout his connection with the company, maintained a progressive spirit, typified in one case by his support of Joseph Becker's design of a new oven.

Mr. Rust led a very active business life and served on many local boards and committees handling civic matters, including the Committee on Teachers Salaries of the Board of Education of Pittsburgh. He was a member of a number of technical and trade associations, including the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Iron and Steel Institute and American Gas Association.

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A. B. SHEPHERD, vice-president, director and a member of the executive committee, Jones & Laughlin Steel Corpn., died suddenly at his residence at Pittsburgh on Jan. 24. He was born on Jan. 12, 1861, in Shepherdstown, Va. In 1880 he went to Mexico with an engineering corporation which surveyed the first railroad line across Mexico. Subsequently he was an engineer

H. B. RUST

with the Mobile & Birmingham Railroad and superintendent of the division with the Brierfield, Brockton & Birmingham Railroad. He went to Pittsburgh in 1892 and became associated with the late Henry B. Rust. In 1910 he joined the Jones & Laughlin Steel Corpn. In addition to his executive offices with that company, he was president and director of the Jones & Laughlin Ore Co., Leetonia Mining Co., Inter-State Iron Co., Interstate Steamship Co. and a director of the Monongahela Connecting Railroad Co., Aliquippa & Southern Railroad Co., Woodlawn Land Co. and the Woodlawn Water Co., all Jones & Laughlin subsidiaries. He was a member of the American Iron and Steel Institute and the American Mining Congress,

A. B. SHEPHERD

and he had represented Jones & Laughlin Steel Corpn. in the National Rivers and Harbors Congress, the Mississippi Valley Association and the Ohio Valley Improvement Association.

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WILL MCCLAIN, well-known steel executive in the Johnstown-Pittsburgh district, died on Jan. 7, aged 91 years. Born in 1845, he served in the Civil War. His first association in the steel industry was in 1882 as superintendent of the plow shop at the Cambria Steel Co., Johnstown, Pa. In 1887 he went with the Johnson Co., now Lorain Steel Co., as assistant superintendent, becoming secretary of the company in 1889. He stayed with the Johnson organization until 1897, when he went to Pittsburgh to establish the Pittsburgh office of the Cambria Steel Co. He served with the latter company through various mergers until about 10 years ago, when he retired.

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JOHN L. SEVERANCE, long associated with the iron and steel industry in the northern Ohio district, died at his home in Cleveland, Jan. 16, aged 72 years. He was a director of the Youngstown Sheet & Tube Co., and chairman of the board of the Youngstown Steel Door Co. at the time of his death. In his early years he was prominently identified with other industrial organizations but in the past few years had devoted his attention largely to civic and philanthropic activities.

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MAJ. JAMES A. MEISSNER, superintendent of the Ensley blast furnaces of the Tennessee Coal, Iron and Railroad Co., Birmingham, died Jan. 16, after a brief illness. During the war Major Meissner was one of the leading aces of the American flying corps and its youngest Major at the front. At the close of the war he returned to Cornell for his M. E. degree, after which he joined the Tennessee company in 1919.

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JOHN J. GLESSNER, one of the founders of the International Harvester Co., died Jan. 20 at Chicago, at the age of 93 years. He was a native of Zanesville, Ohio, where he was educated in the public schools. He served as a vice-president of the International company until 1919, when he was named a director.

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CHARLES E. MCCOMBS, vice-president, W. M. Pattison Supply Co., Cleveland, died Jan. 14 from injuries received by being struck by an automobile. He was 70 years old.

Activities Bearing on Machine Tool Distribution

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A Department Conducted by L. M. Waite

Increasing Production Activity Indicated

REPORTS from men on the firing line in the distribution of machine tools provide the basis for accurate analysis of business recovery.

FROM BOSTON—"The past year has been a very acceptable one to us so far as orders are concerned. Information received from our customers as to buying programs for 1936, leaves little doubt as to what may be expected. A number of our plants are aiming to bring their machine tool lines up to the minute, within a period of two years. After fifty years of activity in machine tool distribution, the writer predicts good business for the first six months of 1936 and continued healthy machine tool purchases for two years."

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FROM NEW YORK—"During 1935 we more than doubled 1934 sales. This increased business has enabled us to double our personnel and from inquiries on hand and quotations outstanding, we are very confident of a like increase in 1936 business. All of our larger customers have already prepared equipment lists intended to feature cost reductions in almost every line of industrial activity."

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FROM TOLEDO, OHIO—"The buying hesitancy of the past several years is fast disappearing. It is readily apparent that manufacturers are again willing to invest in cost reducing machine tools. Because of the tremendous amount of obsolete equipment, we place the trend as definitely upward, manifested by continued actual orders."

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FROM SYRACUSE, N. Y.—"In Syracuse, Rochester and Buffalo territories, the month of December was surprisingly productive of orders. Scattered orders accounted for, to our knowledge, four 18-in. and two 16-in. lathes, two 6- and 7-ft. radial drills, a 10 x 72 hydraulic grinder, four surface grinders, one high-speed precision vertical milling machine, a 24-in. shaper, a Fastermatic, and a No. 1 screw machine. With the exception of two machines, the orders were individual. This, you as a machine tool man will recognize as unusual for any territory in the month of December and of indicating sound recovery in this area."

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FROM PITTSBURGH — "With December of 1935 as an indication of what may be anticipated in 1936, we are optimistic. December was a very worthwhile month with us. A great many of our plants have wakened to a point of realization that the handicap of obsolete equipment is to be augmented by taxes which will be positively prohibitive if the plants are compelled to pay taxes on the wages of men rating, because of inferior equipment, as minimum producers. We believe this to be a very definite factor in the placing of orders and in the development of so outstanding a number of inquiries. The placing of excess surplus into modern equipment will insure that part of surplus against inflation. The sentiment in this area is optimistic."

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FROM DETROIT—"There was considerable equipment sold in this area in 1935. However, specials or standard tools with modifications, had the call. There were more quotations than in any one year for some time past. Numbers of these will, it is hoped, develop into orders during the first six months of 1936. Outside of General Motors expansion at Grand Rapids, Mich., I would hesitate to state that there are many programs on at the moment. All of the motor car builders will make changes and in some instances expansions. I am very optimistic that there will be many buyers of equipment in this area and am fearful of a very heavy demand rather than a gradual change over. As you have repeatedly noted, this will mean that deliveries will be farther off and that the undesirable element of premiums will appear again."

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Machine tool distributers in general, and particularly members of The Associated Machine Tool Dealers who are quite regularly quoted in this column, are far from being, normally, optimists. Their opinions are seldom visionary. By far the greater majority of them have been through a sufficient number of business slumps to recognize all the elements of slump approach, continuance and recovery. They are in daily contact with active management in practically every industry. Almost without exception, their contact men are of proven ability in diagnosing shop conditions and together with the "higher ups" are called into practically every buying program that is originated. In fact they themselves are prime instigators in many programs through their persistent machine tool activity. While the contacts of the individual organization may be of a territorial nature, the total of dealer effort, when boiled down to composite opinion, constitutes a most reliable source of trend information. It is for this reason that we seek out these opinions and present them frequently.

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Herberts-Moore Machinery Co., 550 Fifth Street, San Francisco, has changed its corporate name to Moore Machinery Co. Location, organization and lines handled are continued.

Exports of iron and steel products from Australia for the first nine months of 1935 aggregated 1,035,639 hundredweight, representing a striking increase of 340 per cent when compared with the comparable period of 1935. Imports of iron and steel products into Australia during the third quarter of 1935 amounted to £775,699, a gain of 10.4 per cent when compared with the corresponding period of the previous year. Due to activity in the building industry there has been an increased demand for galvanized iron, and although the Australian mills have increased their output of this product, they are yet unable to meet the demand. With further extensions now being made to existing plants, however, it is expected that local requirements will be met eventually by local production.

Capital Goods Industries Show Decline

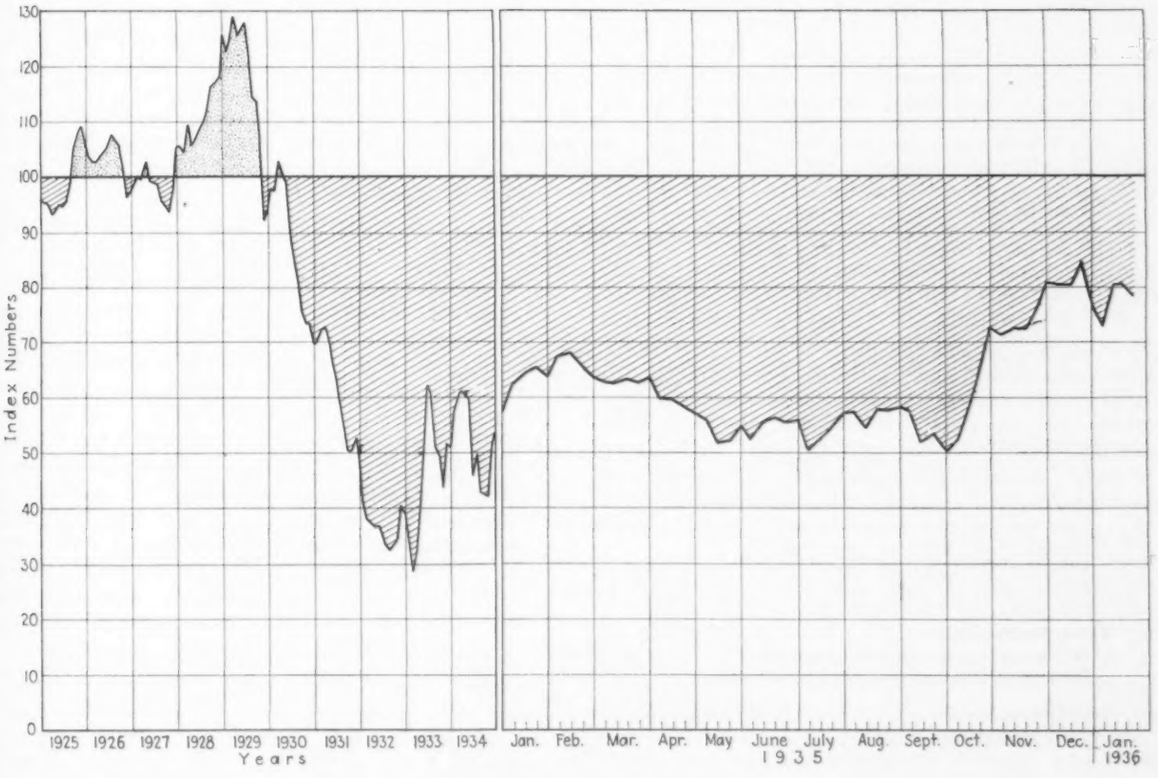
FOR the week ending Jan. 25, THE IRON AGE index of capital goods activity declined to an estimated 78.3 per cent of normal, as measured by the 1925 to 1927 average. Two weeks ago, the figure was 80.7. Setbacks occurred in all but one of the index's five components. The heaviest loss occurred in the automobile production index following news from the Detroit area that producers were curtailing output as a result of restricted sales of new cars. While the steel industry held to the operating rate that prevailed two weeks ago, at this time of year a rise should normally follow. A further reduction in heavy construction contract awards was also felt. Lumber shipments, however, tended upward.

At this time last year, THE IRON AGE's index stood at 63.7, or 23 per cent beneath last week's figure.

The Iron Age Weekly Index Numbers of Capital Goods Activity

(1925-'27 Average = 100)

Last week (est.)	78.3
Preceding week (rev.)	80.7
Same week last month	78.1
Same week 1935	63.7
Same week 1934	53.2
Same week 1933	39.4
Same week 1932	44.3
Same week 1931	70.5
Same week 1930	95.3
Same week 1929	126.8



(1925-27 Average = 100)

The Iron Age Index of Capital Goods Activity. The years 1925 to 1934 are plotted by months, by weeks since 1935.

Components of the index: Steel ingot production rate, from THE IRON AGE; revenue freight carloadings of forest products, from Association of American Railroads; automobile production from Crain's Automotive Reports; heavy construction contract awards, from *Engineering News Record*; index of productive activity in Pittsburgh district, from Bureau of Business Research of University of Pittsburgh.

Current Metal Working Activity Statistically Shown

These Data Are Assembled by The Iron Age from Recognized Sources and Are Changed Regularly as More Recent Figures Are Made Available.

	December, 1935	November, 1935	December, 1934	Year 1934	Year 1935
Raw Materials:					
Lake ore consumption (gross tons)[a]	3,087,236	3,025,694	1,505,751	22,113,951	30,848,179
Coke production (net tons)[b]	3,488,818	3,217,175	2,501,441	31,821,576	35,209,240
Pig Iron:					
Pig iron output—monthly (gross tons)[c]	2,106,453	2,065,913	1,027,622	15,911,188	21,007,802
Pig iron output—daily (gross tons)[c]	67,950	68,864	33,149	43,592	57,556
Castings:					
Malleable castings—production (net tons)[d]	.....	44,277	32,746	369,458	.....
Malleable castings—orders (net tons)[d]	.....	47,778	36,505	354,146	.....
Steel castings—production (net tons)[d]	.....	36,165	23,916	450,087	.....
Steel castings—orders (net tons)[d]	.....	32,714	27,312	434,131	.....
Steel Ingots:					
Steel ingot production—monthly (gross tons)[e]	3,081,807	3,153,247	1,964,257	25,599,118	33,425,576
Steel ingot production—daily (gross tons)[e]	123,272	121,279	78,570	82,312	107,478
Steel ingot production—per cent of capacity[e]	55.68	54.78	35.68	37.38	48.55
Employment in Steel Industry:					
Total employees[e]	.....	438,370	386,345	409,349	.....
Total payrolls (thousands of dollars)[e]	.....	$49,171	$35,363	$457,848	.....
Average hours worked per week[e]	.....	35.7	27.4	30.4	.....
Finished Steel:					
Trackwork shipments (net tons)[e]	3,025	3,090	2,272	49,110	42,229
Sheet steel sales (net tons)[f]	203,318	289,101	193,130	1,830,682	2,473,489
Sheet steel production (net tons)[f]	208,774	224,541	159,740	1,895,460	2,424,990
Fabricated shape orders (net tons)[g]	.....	92,775	67,799	1,054,382	.....
Fabricated shape shipments (net tons)[g]	.....	87,833	88,687	1,116,222	.....
Fabricated plate orders (net tons)[d]	.....	19,116	26,025	241,992	.....
Reinforcing bar awards (net tons)[e]	29,025	11,475	12,661	182,351	318,340
U. S. Steel Corpn. shipments (tons)[h]	661,515	681,820	418,630	5,925,873	7,371,299
Ohio River steel shipments (net tons)[i]	61,666	88,338	46,887	633,197	926,174
Fabricated Products:					
Automobile production, U. S. and Canada[k]	421,579	411,535	156,318	2,869,963	4,182,491
Construction contracts, 37 Eastern States[l]	$264,136,500	$188,115,000	$92,694,900	$1,543,108,400	$1,844,544,900
Steel barrel shipments (number)[d]	541,370	654,596	424,233	6,682,400	6,872,452
Steel furniture shipments (dollars)[d]	.....	$1,591,286	$1,090,171	$11,807,843	.....
Steel boiler orders (sq. ft.)[d]	.....	464,431	259,875	4,368,563	.....
Locomotive orders (number)[m]	55	0	20	183	83
Freight car orders (number)[m]	10,571	25	1,532	24,611	18,699
Machine tool index[n]	98.3	98.6	66.1	†54.1	99.9
Foundry equipment index[o]	118.1	100.4	66.9	†67.5	119.5
Foreign Trade:					
Total iron and steel imports (gross tons)[p]	.....	56,637	19,708	316,761	.....
Imports of pig iron (gross tons)[p]	.....	15,550	3,642	115,470	.....
Imports of all rolled steel (gross tons)[p]	.....	17,089	7,548	113,354	.....
Total iron and steel experts (gross tons)[p]	239,269	205,242	282,655	2,832,764	3,067,336
Exports of all rolled steel (gross tons)[p]	.....	88,008	80,704	951,380	.....
Exports of finished steel (gross tons)[p]	.....	68,324	78,137	833,559	.....
Exports of scrap (gross tons)[p]	148,380	104,961	196,361	1,835,554	2,107,814
British Production:					
British pig iron production (gross tons)[r]	559,300	525,100	513,500	5,978,500	6,422,000
British steel ingot production (gross tons)[r]	811,500	903,300	654,500	8,859,700	9,842,400
Non-Ferrous Metals:					
Lead production (net tons)[s]	42,020	39,957	37,217	412,298	421,764
Lead shipments (net tons)[s]	42,333	43,023	34,680	379,807	433,456
Zinc production (net tons)[t]	40,136	37,469	35,685	366,933	431,085
Zinc shipments (net tons)[t]	41,466	48,172	31,707	352,663	465,154
Deliveries of tin (gross tons)[v]	5,360	4,035	4,530	46,215	59,110

[e]Preliminary. †Three months' average.

Source of figures: [a] Lake Superior Iron Ore Association; [b] Bureau of Mines; [c] THE IRON AGE; [d] Bureau of the Census; [e] American Iron and Steel Institute; [f] National Association of Flat-Rolled Steel Manufacturers; [g] American Institute of Steel Construction; [h] United States Steel Corpn.; [i] United States Engineer, Pittsburgh; [k] When preliminary, from Automobile Manufacturers Association—Final figures from Bureau of the Census; [l] F. W. Dodge Corpn.; [m] *Railway Age;* [n] National Machine Tool Builders Association; [o] Foundry Equipment Manufacturers Association; [p] Department of Commerce; [r] British Iron and Steel Federation; [s] American Bureau of Metal Statistics; [t] American Zinc Institute, Inc.; [v] New York Commodities Exchange.

SUMMARY OF THIS WEEK'S BUSINESS

Severe Weather Checks the Flow Of Iron and Steel

Uncertainty in Automobile Industry Becomes More Pronounced, But Decline in Ingot Output Is Slight—Low Temperatures Strengthen Scrap Prices

SEVERE weather has generally retarded the movement of iron and steel, at the same time accentuating uncertainty in the automobile industry. Used car sales, which hold the key to the production of new motor cars, have been virtually halted. But in the face of this condition, automotive orders for sheets have improved slightly, though they are uniformly for small tonnages, reflecting the current conservatism of the motor trade.

Meanwhile railroad demand for steel continues to improve, and greater activity is noted among machinery builders, farm equipment makers, valve and fitting shops, shelving and locker companies, washing machine manufacturers, and stove plants. Steel pipe orders have risen about 5 per cent above December volume, chiefly because of heavier oil country goods demand, and construction, though at present impeded by the elements, is on an ascending scale, both in terms of steel awards and pending inquiries.

STEEL MILL operations, though showing many variations as between products and producing centers, disclose surprisingly little change in the aggregate, the national ingot rate this week being 50½ per cent, or only one-half point below the average for the three preceding weeks. Output has risen 14 points to 60 per cent in the South, but has declined one point to 36 per cent at Pittsburgh, one-half point to 52½ per cent at Chicago, five points to 30 per cent at Buffalo, two points to 60 per cent in the Valleys and two points to 70 per cent in the Wheeling district. Operations are unchanged at 40 per cent in the Philadelphia district, 66 per cent at Cleveland, 78 per cent in the southern Ohio River area and 100 per cent at Detroit.

THE same sub-zero temperatures that have checked the movement of pig iron and finished steel have served to strengthen scrap prices. Scrap supplies have been rendered inaccessible in many centers; likewise the preparation of yard scrap has been retarded. Such price changes as have occurred in different markets this week have been almost without exception upward. THE IRON AGE scrap composite, an average of No. 1 heavy melting steel prices at Chicago, Pittsburgh and Philadelphia, is unchanged at $13.58 a gross ton.

Structural steel awards of nearly 29,000 tons are the largest since the third week of April, 1935, and compare with 13,950 tons last week. Included in the week's total are 12,300 tons for a section of the West Side elevated highway, New York, and 4300 tons for a General Motors Corpn. plant at Grand Rapids, Mich. Total lettings for January are 101,770 tons, compared with 76,380 tons in December and 76,680 tons in November.

THE United States Engineer's Office at Kansas City has awarded 4500 tons of reinforcing bars to a Youngstown mill. Two Pacific Coast distributers are reported to have placed mill orders for 13,350 tons of concrete bars for the Colorado River aqueduct. The amount of steel to be purchased for this project in 1936 by the Los Angeles water district is officially placed at 96,600 tons, of which 33,000 tons will be plates, 15,100 tons structural shapes and the remainder reinforcing bars.

Railroad buying is featured by the purchase of 16,000 tons of rails by the Chicago & North Western. The New York Central is due to close this week for 35,000 tons of rails and 10,000 tons of accessories. Other roads figuring on rail requirements include the Milwaukee Road, the Rock Island, the Chicago & Eastern Illinois, the Missouri Pacific, the Erie and the Virginian. The Wabash has placed 2000 tons of steel for the reconstruction of 300 hopper cars and has obtained court authority to repair 1300 freight cars. The Erie will buy 500 box cars and 300 automobile cars. The Lehigh Valley will build 500 new open-top cars and will rebuild an equal number. The Pacific Fruit Express is in the market for 3000 refrigerator cars.

THE lull in the motor car industry, as well as among other steel consuming interests, has had its effect on market sentiment. Projected advances in various finished steel products now seem remote, and non-integrated mills are increasing their pressure against present semi-finished quotations in an effort to restore the margin that their own products formerly held. Along the Gulf and Atlantic seaboards, where foreign competition is most severe, wire nail prices have been subject to concessions of 20c. or more a keg. On sizable construction projects cuts of $2 a ton on reinforcing bars have become more common. Resale pipe remains irregular in Eastern centers, and fabricated structural steel bids are becoming more sharply competitive.

THE IRON AGE composite prices for finished steel and pig iron are unchanged at 2.130c. a lb. and $18.84 a gross ton respectively.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous; Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron

Per Gross Ton:	Jan. 28, 1936	Jan. 21, 1936	Dec. 30, 1935	Jan. 29, 1935
No. 2 fdy., Philadelphia	$21.3132	$21.3132	$21.3132	$20.26
No. 2, Valley furnace	19.50	19.50	19.50	18.50
No. 2 Southern, Cin'ti	20.2007	20.2007	20.2007	19.13
No. 2, Birmingham†	15.50	15.50	15.50	14.50
No. 2 foundry, Chicago*	19.50	19.50	19.50	18.50
Basic, del'd eastern Pa.	20.8132	20.8132	20.8132	19.76
Basic, Valley furnace	19.00	19.00	19.00	18.00
Malleable, Chicago*	19.50	19.50	19.50	18.50
Malleable, Valley	19.50	19.50	19.50	18.50
L. S. charcoal, Chicago	25.2528	25.2528	25.2528	24.04
Ferromanganese, seab'd carlots	75.00	75.00	85.00	85.00

†This quotation is for delivery in South; in the North prices are 38c. a ton under delivered quotations from nearest Northern furnace.

*The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Rails, Billets, etc.

Per Gross Ton:				
Rails, heavy, at mill	$36.37½	$36.37½	36.37½	$36.37½
Light rails, Pittsburgh	35.00	35.00	35.00	35.00
Rerolling billets, Pittsburgh	29.00	29.00	29.00	27.00
Sheet bars, Pittsburgh	30.00	30.00	30.00	28.00
Slabs, Pittsburgh	29.00	29.00	29.00	27.00
Forging billets, Pittsburgh	35.00	35.00	35.00	32.00
Wire rods, Pittsburgh	40.00	40.00	40.00	38.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.80	1.80	1.80	1.70

Finished Steel

Per Lb.:	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.85	1.85	1.85	1.80
Bars, Chicago	1.90	1.90	1.90	1.85
Bars, Cleveland	1.90	1.90	1.90	1.85
Bars, New York	2.20	2.20	2.20	2.13
Plates, Pittsburgh	1.80	1.80	1.80	1.80
Plates, Chicago	1.85	1.85	1.85	1.85
Plates, New York	2.09	2.09	2.09	2.08
Structural shapes, Pittsburgh	1.80	1.80	1.80	1.80
Structural shapes, Chicago	1.85	1.85	1.85	1.85
Structural shapes, New York	2.06¼	2.06¼	2.06¼	2.05¼
Cold-finished bars, Pittsburgh	2.10	2.10	1.95	2.10
Hot-rolled strips, Pittsburgh	1.85	1.85	1.85	1.85
Cold-rolled strips, Pittsburgh	2.60	2.60	2.60	2.60

Finished Steel

Per Lb.:	Jan. 28, 1936 Cents	Jan. 21, 1936 Cents	Dec. 30, 1935 Cents	Jan. 29, 1935 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.40
Hot-rolled annealed sheets, No. 24, Gary	2.50	2.50	2.50	2.50
Sheets, galv., No. 24, Pittsburgh	3.10	3.10	3.10	3.10
Sheets, galv., No. 24, Gary	3.20	3.20	3.20	3.20
Hot-rolled sheets, No. 10, Pittsburgh	1.85	1.85	1.85	1.85
Hot-rolled sheets No. 10, Gary	1.95	1.95	1.95	1.95
Wire nails, Pittsburgh	2.40	2.40	2.40	2.60
Wire nails, Chicago dist. mill	2.45	2.45	2.45	2.65
Plain wire, Pittsburgh	2.30	2.30	2.30	2.30
Plain wire, Chicago dist. mill	2.35	2.35	2.35	2.35
Barbed wire, galv., Pittsburgh	2.80	2.80	2.80	3.00
Barbed wire, galv., Chicago dist. mill	2.85	2.85	2.85	3.05
Tin plate, 100 lb. box, Pittsburgh	$5.25	$5.25	$5.25	$5.25

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$14.50	$14.50	$14.25	$13.25
Heavy melting steel, Phila.	12.75	12.75	12.50	11.75
Heavy melting steel, Ch'go	13.50	13.50	13.25	11.50
Carwheels, Chicago	*13.00*	13.25	13.25	12.00
Carwheels, Philadelphia	14.75	14.75	13.00	10.75
No. 1 cast, Pittsburgh	14.25	14.25	14.25	13.75
No. 1 cast, Philadelphia	13.00	13.00	13.00	11.00
No. 1 cast, Ch'go (net ton)	12.00	12.00	12.00	10.00
No. 1 RR. wrot., Phila.	13.25	13.25	12.25	11.25
No. 1 RR. wrot., Ch'go (net)	11.00	11.00	11.00	10.50

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.65	$3.65	$3.65	$3.85
Foundry coke, prompt	4.25	4.25	4.25	4.60

Metals

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Electrolytic copper, Conn.	9.25	9.25	9.00	8.75
Lake copper, New York	9.37½	9.37½	9.37½	9.12½
Tin (Straits), New York	*46.30*	46.87½	48.62½	50.95
Zinc, East St. Louis	4.85	4.85	4.85	3.70
Zinc, New York	5.22½	5.22½	5.22½	4.05
Lead, St. Louis	4.35	4.35	4.35	3.55
Lead, New York	4.50	4.50	4.50	3.70
Antimony (Asiatic), N. Y.	12.62½	12.62½	14.50	14.50

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
Jan. 28, 1936	2.130c. a Lb.	$18.84 a Gross Ton	$13.58 a Gross Ton
One week ago	2.130c.	18.84	13.58
One month ago	2.130c.	18.84	13.33
One year ago	2.124c.	17.90	12.17
	Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strips. These products represent 85 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1935	2.130c., Oct. 1	2.124c., Jan. 8	$18.84, Nov. 5	$17.83, May 14	$13.42, Dec. 10	$10.33, April 23
1934	2.199c., April 24	2.008c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	2.015c., Oct. 3	1.867c., April 18	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.977c., Oct. 4	1.926c., Feb. 2	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	2.037c., Jan. 13	1.945c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.273c., Jan. 7	2.018c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.317c., April 2	2.273c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.286c., Dec. 11	2.217c., July 17	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22

Trend of Demand Downward at Pittsburgh

But Reversal Is Expected in February —Output Off Locally, in Valleys and in Wheeling District — Scrap Remains Strong

PITTSBURGH, Jan. 28.—Aggregate demand for finished steel in this district shows a slight downward tendency, but all indications point to a reversal of this trend in February. Sharply reduced schedules at the local rail mill and one or two other units at the beginning of the current week will depress the average rate one point to 36 per cent of capacity.

Severe weather and reduced specifications from automobile channels are responsible for the sporadic pace of orders. On the other hand, tin plate demand is holding up unusually well, and sheet steel business is managing to maintain recent volume despite the AAA's demise and uncertainty of the automobile outlook. Demand for strip steel has been quick to reflect hesitancy in some automobile centers. The movement of construction steel has been affected adversely by severe weather in many districts. The trend of operations in the Wheeling district and in nearby northern Ohio and Valley mills is slightly downward, with ingot output in both districts off two points to 70 and 60 per cent respectively.

Pig Iron

Foundry melt in this district is spotty, and demand for pig iron consequently is irregular. Orders are almost entirely for small quantities for fill-in needs. Water movement has been completely arrested by the freezing over of the Monongahela and Allegheny rivers.

Semi-Finished Steel

The prices nominally established last November have not met a crucial test, since most of the large non-integrated mills still are depending upon low-priced contracts to take care of current requirements. In some instances, shipments of semi-finished steel at the old prices will be made until Feb. 15, more or less assuring mills of a chance to cover pretty far ahead in the quarter. It seems unlikely, therefore, that the new prices will be definitely established until the latter half of the quarter. Even beyond that point, non-integrated sheet and strip mills intimate that continued pressure will be exerted against the higher prices unless the finished steel prices are brought into balance with the new semi-finished schedules.

Bars

Aggregate volume has not slipped in the past week, but the outlook for a sustained demand is somewhat vague. Bar orders for the Pennsylvania Railroad freight car building program have begun to filter in, but these placements thus far have been too small to accelerate rolling schedules. There is no assurance yet that the car building business will provide bar producers with a sudden influx of substantial orders, as had been expected. Recession in automotive demand is the most unsettling factor in this market.

Rail and Track Supplies

The local rail mill this week probably will run exclusively on sheet bar tonnage. Backlogs of rails have been practically cleaned up, and further rail schedules will depend upon placements of orders pending. The track accessory market is dull, with most carriers taking in supplies only as needed for current maintenance.

Bolts, Nuts and Rivets

Orders are beginning to show up better than was expected in the face of heavy December buying. A few orders for Pennsylvania Railroad freight cars have been placed, but not in unusually large volume. Automotive specifications have shrunk measurably. Prices, while not entirely devoid of unsettlement in some areas, are growing steadier.

Reinforcing Steel

The United States Engineer Office at Kansas City has awarded 4500 tons to Youngstown Sheet & Tube Co. for the Fort Peck, Mont., dam project. All bids were submitted at a delivered price of 2.08c. Deliveries have been retarded quite generally by sub-zero weather in the East and Mid-West. New public works projects, at the same time, are suffering from the same weather conditions, which at present show little promise of improvement. Prices still are soft, with concessions running as high as $6 a ton on some projects.

Cold-Finished Bars

Miscellaneous business is the sustaining force in this market, which is being held back by a slower demand for automobile consumption. Shipments have been retarded by severe weather, and in order for all December specifications for January shipment to be cleaned up by Jan. 31 deadline a fairly heavy movement is in prospect for this week. New business being booked at the 2.10c., Pittsburgh, price is meager. There is little question but that large consumers will be well covered at the old price by the end of January, and commitments at the higher quotation will be in restricted volume well into February.

Plates and Shapes

The International Petroleum Co., Toronto, awarded contract to Marietta Mfg. Co. for oil barges entailing 400 tons of plates and shapes. Not many new barges are being launched in this district in view of the frozen rivers. Repair work is also being retarded by cold weather. Other construction is suffering a similar condition, and fabricating schedules are slower.

The most notable structural steel contract reaching this district in the past week is for 4200 tons placed with Jones & Laughlin Steel Corpn. for the Grand Rapids, Mich., plant for General Motors Corpn. The list of fresh inquiries is meager both as to number of projects and individual tonnages.

Tubular Goods

Some pipe makers in this district report orders running about 5 per cent higher than those in December. This improvement may be traced chiefly to heavier oil country goods buying. A fair amount of galvanized lapweld pipe probably will be purchased soon for the Pennsylvania Railroad freight cars. Prices for most items unquestionably are firm, with the possible exception of small-diameter butt weld pipe.

Sheet Steel Piling

Bids are being taken at Denver by the Bureau of Reclamation on Jan. 30 for a small tonnage, representing the first portion of the 2700 tons required for the all-American canal in the Imperial Valley. Further bids are likely to

be invited within a few weeks. Shipments out of this district have been unimportant, owing to recent weather conditions, with the exception of those for the Miami harbor improvement project. Severe weather also has retarded cutting operations at piling mills, but rolling schedules have not been similarly affected.

Wire Products

Demand is showing a slight tendency to diminish, owing largely to reduced takings by the automobile industry. Merchant business from extreme South and Southwest centers, not affected by recent inclement weather, is beginning to appear, and when such business gains momentum the increased volume may offset the diminishing trend in automobile consumption. The question, however, of the ultimate behavior of demand from agricultural districts, still uncertain as to the effects of the AAA's demise, probably will not be answered until the Administration arrives at a more definite farm program. Miscellaneous manufacturing demand is holding its own.

Sheets

Sheet operations are hovering around 65 per cent of capacity. How long this rate will be sustained in the face of present conditions is conjectural. The automobile industry has not yet noticeably curtailed its takings of sheets, but this seems likely if more open weather does not soon appear to stimulate the sale of used cars, the surplus of which is drastically retarding new car turnover. Agricultural areas still are a bit timid about ordering in the face of the AAA postmortem as well as severe weather. Unsettlement in prices for formed roofing is pronounced, with irregularities spreading to other districts heretofore unscathed. Hot-rolled sheet prices appear to be firm, while those for certain wide cold-rolled items are more susceptible to concessions.

Tin Plate

Schedules in some cases this week are being accelerated, although the general tendency is to hold to recent rolling averages. The industry in the current period probably will average a full 60 per cent of capacity, the leading producer having stepped up operations. Demand for general line can manufacture is a prominent influence. The pineapple pack also is under way and is a contributory factor. There is nothing unusual in current demand for "beer plate" excepting that an astonishingly large number of breweries were disclosed at the recent canners' convention to be using cans for beer distribution.

Strip Steel

Reduced activity at automobile centers is noticeably depressing aggregate demand for hot- and cold-rolled strip. Although district offices reporting to headquarters at Pittsburgh are optimistic in their general observations of early prospective demand, the outlook here is tempered by the used car problem, which has further been complicated by the prolonged spell of freezing weather. At the same time, miscellaneous buyers are taking in strip at a practically unchanged rate. The reduced automobile orders, however, will probably push output down 5 points this week to about 45 per cent of capacity.

Coal and Coke

Orders for all domestic fuels are pouring in, but shipments are not keeping pace, owing to difficult shipping conditions during the record-breaking cold weather. Now that some small producers have a chance to capitalize on a legitimate demand for fuel, it is ironical that the cold weather has in many cases prevented operating mines which cannot be entered on account of the heavy snows. Nevertheless production of domestic sizes is still sufficiently heavy to add to the large accumulation of slack, which consequently is far in excess of demand. Foundry coke is moving a little faster in single carload shipments, while furnace coke, excepting for heating purposes, is relatively quiet. All prices are marking time, with little test provided for any grade.

Scrap

Meager scrap supplies have been made more inaccessible by sub-zero weather in the past ten days. Preparation of yard scrap also has been retarded by untoward weather conditions. Mills, however, evidently are keeping their eye on the ingot production chart, which momentarily shows no definite trend, and are awaiting signs of an upturn before committing themselves for additional scrap. Prices are definitely firm, with the entire list devoid of any single weak spot. The latest Pennsylvania Railroad scrap list covers a total of about 28,000 tons, including 11,150 tons of No. 1 heavy melting steel. The current Baltimore & Ohio list totals only 4800 tons, including 2000 tons of No. 1 steel.

Complete statistics on the tonnage of ores and finished steel shipped by water in the United States in 1934, including all rivers, the Gulf of Mexico, the Great Lakes and coast-wise traffic are published in a volume compiled in the office of the Board of Engineers for Rivers and Harbors, War Department, entitled "Commercial Statistics, Water-borne commerce of the United States for the Calendar Year 1934."

Weekly Indications of Steel Activity

From THE IRON AGE

	Jan. 28, 1936	Jan. 21, 1936	Dec. 30, 1935	Jan. 29, 1935	Average Year to Date 1936	Average Year to Date 1935
Steel ingot operations—Per cent of capacity	50.5	51.0	47.5	56.0	50.4	48.9

	Week Ended Jan. 28, 1936	Jan. 21, 1936	Dec. 30, 1935	Jan. 29, 1935	Year to Date 1936	Year to Date 1935
Fabricated structural steel awards	28,970	13,950	20,000	5,250	80,570	68,400
Fabricated plate awards	875	1,400	16,235	1,200	46,022	40,285
Sheet steel piling awards	0	0	0	0	3,600	4,300
Reinforcing bar awards	27,460	8,300	5,600	0	62,210	32,550

Cast Iron Pipe

Falmouth, Me., has awarded 390 tons of 8-in. to an Eastern foundry.

Pittsfield, Mass., has closed bids on 300 tons of 4 to 20-in. United States Pipe & Foundry Co. is low bidder.

Massachusetts Metropolitan Sewer Division has awarded 220 tons of 54-in. to Warren Foundry & Pipe Corpn.

Worcester, Mass., has awarded 103 tons of 14-in. to Florence Pipe, Foundry & Machine Co.

Milton, N. H., has placed 250 tons of 4 to 10-in. with Warren Foundry & Pipe Corpn.

Chicopee, Mass., has awarded 100 tons of 6-in. to Warren Foundry & Pipe Corpn.

Vanceboro, N. C., plans pipe lines for water system. Fund of $63,000 is being arranged for this and other waterworks installation, and sewerage lines. J. B. McCrary Co., Marietta Street Building, Atlanta, Ga., is consulting engineer.

Mina, Nev., plans pipe lines for water system and other waterworks installation. Fund of $39,300 has been arranged, in part through Federal aid.

Oak Grove, Mo., will soon take bids for pipe for water system; also elevated steel tank and tower. Black & Veatch, 4706 Broadway, Kansas City, Mo., are consulting engineers.

Cardington, Ohio, will take bids early in February for pipe for water system; also for elevated steel tank and tower and other waterworks installation. Cost about $75,000. Jennings & Lawrence, 12 North Third Street, Columbus, Ohio, are consulting engineers.

Port Orford, Ore., closes bids Feb. 1 for 10,900 ft. of 6, 8 and smaller pipe for water system; also 8500 ft. of galvanized iron pipe, water meters and other waterworks equipment.

Ashley, Ind., will soon take bids for pipe for water system; also for 65,000-gal. elevated steel tank and tower, pumping machinery and other waterworks equipment. Cost about $95,000. Lennox & Matthews, Architects' Building, Indianapolis, are consulting engineers.

Plymouth, N. C., plans pipe lines for extensions and improvements in water system. Fund of $65,400 is being arranged through Federal aid. W. C. Olsen, Raleigh, N. C., is consulting engineer.

Andrews, N. C., plans pipe lines for water system; also other waterworks installation. Fund of $54,500 is being arranged for this and sewerage lines. A. H. Vanderhoff, Asheville, N. C., is consulting engineer.

Greenbrier, Tenn., plans pipe lines for water system. Bond issue of $23,000 has been authorized for this and other waterworks installation.

Columbus, Neb., plans pipe lines for extensions in water system. Fund of $24,000 is being arranged through Federal aid. L. F. Gottschalk is city engineer.

Everett, Wash., plans new 12-in. for water system in Legion Memorial Park district; and has authorized estimates of cost for new pipe line for main water supply from Lake Chaplain for local industrial service, including new pumping station on Snohomish River near Lowell. C. J. Ericson is commissioner of public works.

Mound Valley, Kan., has rejected bids recently received for pipe for water system and other waterworks installation. New bids will be asked soon. Cost about $49,000. Albert C. Moore, Joplin, Mo., is consulting engineer.

McCammon, Idaho, has placed 329 tons of 6 and 8-in. with Pacific States Cast Iron Pipe Co.

Los Angeles Department of Water and Power will open bids Feb. 4 on 100 tons of 2-in.

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Growing Volume of Railroad Buying Is Chief Hope for Sustained Operations — Severe Weather Supports Scrap Market

CHICAGO, Jan. 28. — Both sales and specifications for finished steel have dropped back, but so far ingot production has receded only one-half point to 52½ per cent of capacity. The future trend is uncertain because such improvements as can be observed at this time may be more than offset by the drop in automobile business.

The railroads are offering more support to the market and their tonnage requirements can be counted on to grow as winter wanes. The Pacific Fruit Express and the Santa Fe cars are attractive inquiries and more of this kind of business is expected from western and northwestern railroads. Despite extremely cold weather northern lines are planning track work, and rail mills have received releases which permit schedules for the next two to three months. The Chicago & Northwestern has ordered 16,000 tons of rails and may place more at a later date.

Specifications for structural materials are steady but new awards and inquiries are not encouraging. On the brighter side of the picture is greater activity among machinery builders, farm implement makers, valve and fitting shops and shelving and locker manufacturers.

The scrap market has an exceptionally strong undertone, but it is difficult at this time to gage how much of this is due to cold weather, which has frozen stock piles and restricted shipments. One thing is certain, however, and that is dealers and brokers have lost none of their zest to view the market from a highly speculative angle.

Pig Iron

January shipments will total about one-half of the movement in December, when users were pushing releases against fourth quarter commitments. New buying remains largely on a spot basis, but here and there a first quarter contract is being added to makers' books. Jobbing foundries in this area are doing better, especially for castings going to machine tool manufacturers. Castings moving to automobile builders are in lighter volume.

Reinforcing Bars

Sub-zero weather has put an end to outdoor work and, for that matter, the desire to close contracts for new work. The market is quiet in inquiries, awards and shipments against old orders. Prospects do not loom large at this time but it is noticeable that preliminary plans for private work do look better for early spring. Prices are being knocked from pillar to post on some of the larger tonnages. Although bids are entered at the market, seller resistance sometimes weakens near the closing date and concessions of $4, or more, a ton have been made.

Cast Iron Pipe

Extreme cold, which would ordinarily lay low the cast iron pipe market, is actually having little effect for the reason that most work now in progress is being done by WPA workers who are being kept busy regardless of conditions from which a contractor would shrink because of unwarranted costs. All things considered, shipments are in fair volume and new buying, though all in small lots, is moderately active. PWA officials are still checking at Milwaukee and that tonnage has not yet been entered on foundry books.

Wire Products

Output holds close to 50 per cent of capacity, but both new sales and specifications have turned spotty. The exact reason for this variable quality does not appear on the surface and sellers are inclined to blame it on the weather, which has been severely cold for over a week throughout most of the country. Demand from automobile makers continues to drop, but the miscellaneous manufacturing trade is fairly steady. Nails and barbed wire are moving in better volume to jobbers, but woven wire fencing is not yet being taken in quantity. Electrical cable is in broader demand as utilities once again come into the market. The outlook for railroad business in the spring is distinctly encouraging.

Plates

The best prospects in this market lie among the railroads. The Pacific Fruit Express is coming into the market for 3000 refrigerator cars, the Chesapeake & Ohio is planning a large repair program and the Burlington is starting on the repair of the second lot of 500 cars. The Burlington has ordered two 10-car light-weight trains, and local mills are expecting to figure on car material for a number of the Northwestern railroads. In the meantime railroad shops are busy on general repairs and some railroads are planning to expand these operations.

Rails

The Chicago & Northwestern has ordered 16,000 tons of rails from Inland Steel Co. and it may make additional purchases in the near future. The New York Central is expected to close tomorrow for 35,000 tons of rails and about 10,000 tons of accessories. Other railroads that are figuring on requirements include the Milwaukee Road, the Rock Island, the Chicago & Eastern Illinois and the Missouri Pacific. Despite cold weather rail releases are again reaching mills, which have resumed operations and are now scheduled for from two to three months. Miscellaneous accessory business is in fair volume.

Sheets

Automobile demand is dropping and some mills are stocking semi-finished materials against possible future upturn in demand. Miscellaneous demand shows moderate improvement, though sellers believe it is somewhat hampered by extreme cold weather. Deliveries on sheet products vary from two to four weeks.

Bars

The general trade is holding steady and some lines are expanding. Several farm implement manufacturers who had announced heavier schedules for 1936 are carrying out their plans. Machinery builders are busy, and valve and fitting plants are taking more steel. The road machinery show at Cleveland was pronounced a success and builders of this equipment expect to expand operations in the very near future.

Structural Material

Fabricators' purchases from mills are steady, but new business taken this week by shops points to

lighter shipments of structural materials unless a turn for the better comes in the very near future. The few awards are public projects, as are the few bridge jobs that make up the list of fresh inquiries.

Scrap

Between the meeting last week of the Institute of Scrap Iron and Steel and a week of sub-zero weather the scrap market has been almost without feature. The institute meeting was a real success, and for that matter so is the cold weather. Frozen scrap piles have blocked shipments and dealers are having no trouble in getting $14 a gross ton delivered for heavy melting steel. Mills, however, have not paid over $13.75. Railroad offerings are light but are expected to grow at the end of the month. Foundries are still taking scrap promptly after placing orders. Despite cold weather borings are being sent to Chicago docks for storage.

Worcester Mill Buys 10,000 Tons of Scrap

BOSTON, Jan. 28.—Notwithstanding its four months' stock pile, the American Steel & Wire Co., Worcester, Mass., last week bought 10,000 tons of scrap, mostly No. 2 steel. The bulk was purchased at $10.55 a ton, delivered Worcester, on shipments from the Boston area, and a smaller tonnage at 75c. a ton less on shipments from other New England points. Thus the export price was met, the first important instance in which a domestic consumer has done so. A few small lots of turnings and bundled skeleton from eastern Massachusetts, and No. 1 steel from western Massachusetts and northern New England are moving for Pittsburgh consumption, but that market is hardly a factor here.

On the other hand, the export market is very active and strong. One vessel with more than 3000 tons sailed the past week for Scotland, and two other steamers are scheduled to begin loading here this week an aggregate of better than 8000 tons. Bidding for vessels by exporters is brisk, with the available supply rather small. A contract has been made to load scrap here and at Providence, R. I., next month. No. 1 machinery cast is moving in a small way to New England consumers at prices running up to $10.50 a ton delivered, and No. 1 textile at $10.

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Current pig iron buying is confined to occasional car and scattered truck lots. A sample lot of 400 tons of Belgian iron is being offered at prices under those for domestic brands. It is the first time Belgian iron has been offered here in several years. Sellers of Indian iron are holding to price schedules for domestic irons, but all other foreign brands have been offered, silicon differentials taken into account, at concessions of $1 to $4 a ton.

Detroit Scrap Is Strong

DETROIT, Jan. 28.—The scrap market is strong and a rise in prices is expected the coming week. Curtailment of automobile production has cut supply and cold weather has hampered yard operations. Both factors favor a price increase. Some prices are reported spotty and out of line on the high side.

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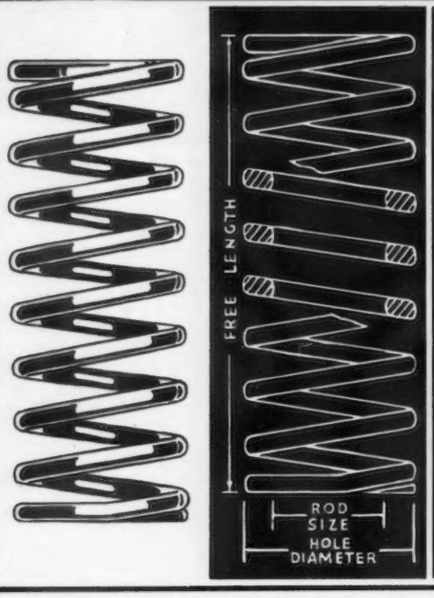

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Crossing Awards On Coast

SAN FRANCISCO, Jan. 27.—Letting of contracts covering steel requirements of State grade crossings in southern California featured the past week's activity on the Coast. Consolidated Steel Corpn. booked 2875 tons of structural steel for four crossings and for tunnel supports for the Metropolitan Water district. Approximately 380 tons of shapes went to Virginia Bridge & Iron Co.

It is reported that J. F. Shea Co., Inc., has purchased 7850 tons of reinforcing bars, involved in its contract on the Colorado River aqueduct, from Bethlehem Steel Co. United Concrete Pipe Co. has placed 5500 tons of bars required in its part of the aqueduct, but the name of the successful bidder is not known. Soule Steel Co., W. C. Hauck & Co., Gunn, Carle Co. and Kyle & Co. took 511, 192, 249 and 133 tons of bars, respectively, on projects in or near San Francisco.

Outstanding among the new projects listed during the week was the inquiry for 1259 tons of H-piling for foundations at the Civic Center at San Diego. Bids will be opened Jan. 29 at San Francisco by the Treasury Department. Indications point toward bids in the near future on one or more units of the Central Valley project.

Further Dip in Buffalo Rate

BUFFALO, Jan. 28.—After being shut down completely last week, the Republic Steel Corpn. was due to light three and possibly four open-hearth furnaces this week. The Lackawanna plant of the Bethlehem Steel Co. has reduced its operation from ten to nine open-hearths. The Seneca sheet division of Bethlehem is operating at 90 per cent, and the Wickwire Spencer Steel Co. continues to operate one open-hearth.

Republic Steel Corpn. has banked one of its blast furnaces and is now operating one; Bethlehem's Lackawanna plant is operating three, Hanna Furnace Corpn., two, and Tonawanda Iron Corpn., one.

Pig iron consumption is easing, probably because of decreased automobile business. Foundries are expected to show more activity when the spring car rush begins. Shipments of pig iron at the present time are moderate. Most users laid in a supply of iron prior to the price increase, Nov. 1, covering for their expected requirements well into the first quarter. No large orders are being taken, but there is a fair volume of carload lot buying along with some 100- and 200-ton orders.

The scrap market is quiet, but strong. Inclement weather has practically stopped yard movement. The largest consumer, which had offered $12 for No. 1 heavy melting steel, increased this price to $12.50 for a brief period, but has now withdrawn the offer. The next largest consumer has recently suspended shipments. Outside market prices are still high enough to permit shipments from territory ordinarily feeding the Buffalo yards.

Hughes Heads Western Pennsylvania Engineers

I. LAMONT HUGHES, executive vice-president, Carnegie-Illinois Steel Corpn., Pittsburgh, has been elected president of the Engineers Society of Western Pennsylvania, succeeding Frank F. Schauer. He was officially installed at the society's annual reception at the Hotel William Penn, Pittsburgh, on Jan. 28.

I. LAMONT HUGHES

The Engineers Society of Western Pennsylvania was organized in January, 1880, for the purpose of interchanging ideas and developing closer acquaintanceship of engineers in the Pittsburgh district.

Prices of Finished Steel and Iron Products

BARS, PLATES, SHAPES

Iron and Steel Bars

Soft Steel	*Base per Lb.*
F.o.b. Pittsburgh	1.85c.
F.o.b. Chicago	1.90c.
F.o.b. Gary	1.90c.
F.o.b. Duluth	2.00c.
Del'd Detroit	2.00c.
F.o.b. Cleveland	1.90c.
F.o.b. Buffalo	1.95c.
Del'd Philadelphia	2.16c.
Del'd New York	2.20c.
F.o.b. Birmingham	2.00c.
F.o.b. cars dock Gulf ports	2.25c.
F.o.b. cars Pacific ports	2.40c.

Rail Steel

(For merchant trade)

F.o.b. Pittsburgh	1.70c.
F.o.b. Chicago	1.75c.
F.o.b. Gary	1.75c.
F.o.b. Moline, Ill.	1.75c.
F.o.b. Cleveland	1.75c.
F.o.b. Buffalo	1.80c.
F.o.b. Birmingham	1.85c.
F.o.b. cars dock Gulf ports	2.10c.
F.o.b. cars dock Pacific ports	2.25c.

Billet Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	2.05c.
F.o.b. Chicago	2.10c.
F.o.b. Gary	2.10c.
Del'd Detroit	2.20c.
F.o.b. Cleveland	2.10c.
F.o.b. Youngstown	2.10c.
F.o.b. Buffalo	2.10c.
F.o.b. Birmingham	2.10c.
F.o.b. cars dock Gulf ports	2.45c.
F.o.b. cars dock Pacific ports	2.45c.

Rail Steel Reinforcing

(Straight lengths as quoted by distributors)

F.o.b. Pittsburgh	1.90c.
F.o.b. Chicago	1.95c.
F.o.b. Gary	1.95c.
F.o.b. Cleveland	1.95c.
F.o.b. Youngstown	1.95c.
F.o.b. Buffalo	1.95c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.30c.
F.o.b. cars dock Pacific ports	2.30c.

Iron

F.o.b. Chicago	1.80c.
F.o.b. Pittsburgh (refined)	2.10c.
Delivered New York	2.05c.
Delivered Philadelphia	2.10c.

Cold Finished Bars and Shafting*

	Base per Lb.
F.o.b. Pittsburgh	2.10c.
F.o.b. Chicago	2.15c.
F.o.b. Gary	2.15c.
F.o.b. Cleveland	2.15c.
F.o.b. Buffalo	2.20c.
Del'd Detroit	2.30c.
Del'd eastern Michigan	2.35c.

* In quantities of 10,000 to 19,999 lb.

Fence and Sign Posts

Angle Line Posts

	Base per Net Ton
F.o.b. Pittsburgh	$54.00
F.o.b. Chicago	54.00
F.o.b. Duluth	55.00
F.o.b. Cleveland	54.00
F.o.b. Birmingham	57.00
F.o.b. Houston, Orange, Beaumont, Galveston	63.00
F.o.b. Mobile	62.00
F.o.b. New Orleans, Lake Charles, Corpus Christi	63.00
F.o.b. cars dock Pacific ports	67.00

Plates

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
F.o.b. Gary	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Coatesville	1.90c.
F.o.b. Sparrows Point	1.90c.
Del'd Philadelphia	1.99c.
Del'd New York	2.00c.
F.o.b. Birmingham	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.
Wrought iron plates, f.o.b. P'gh	3.20c.

Floor Plates

F.o.b. Pittsburgh	3.35c.
F.o.b. Chicago	3.40c.
F.o.b. Coatesville	3.45c.
F.o.b. cars dock Gulf ports	3.75c.
F.o.b. cars dock Pacific ports	3.90c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh	1.80c.
F.o.b. Chicago	1.85c.
Del'd Cleveland	1.995c.
F.o.b. Buffalo	1.90c.
F.o.b. Bethlehem	1.90c.
Del'd Philadelphia	2.015c.
Del'd New York	2.0625c.
F.o.b. Birmingham (standard)	1.95c.
F.o.b. cars dock Gulf ports	2.20c.
F.o.b. cars dock Pacific ports	2.35c.

Steel Sheet Piling

	Base per Lb
F.o.b. Pittsburgh	2.15c.
F.o.b. Chicago	2.25c.
F.o.b. Buffalo	2.25c.
F.o.b. cars dock Gulf ports	2.60c.
F.o.b. cars dock Pacific ports	2.60c.

SHEETS, STRIP, TIN PLATE TERNE PLATE

Sheets

Hot Rolled

	Base per Lb.
No. 10, f.o.b. Pittsburgh	1.85c.
No. 10, f.o.b. Gary	1.95c.
No. 10, del'd Detroit	2.05c.
No. 10, del'd Phila.	2.16c.
No. 10, f.o b. Birmingham	2.00c.
No. 10, f.o.b. cars dock Pacific ports	2.40c.

Hot-Rolled Annealed

No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Gary	2.50c.
No. 24, del'd Detroit	2.45c. to 2.60c.
No. 24, del'd Phila.	2.71c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, f.o.b. cars dock Pacific ports	3.05c.
No. 24, wrought iron, Pittsburgh	4.30c.

Heavy Cold-Rolled

No. 10 gage, f.o.b. Pittsburgh	2.50c.
No. 10 gage, f.o.b. Gary	2.60c.
No. 10 gage, f.o.b. Detroit	2.55c. to 2.70c.
No. 10 gage, del'd Phila.	2.81c.
No. 10 gage, f.o.b. Birmingham	2.65c.
No. 10 gage, f.o.b. cars dock Pacific ports	3.10c.

Light Cold-Rolled

No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Gary	3.05c.
No. 20 gage, del'd Detroit	3.00c. to 3.15c.
No. 20 gage, del'd Phila.	3.26c.
No. 20 gage, f.o.b. Birmingham	3.10c.
No. 20 f.o.b. cars dock Pacific ports	3.50c.

Galvanized Sheets

No. 24 gage, f.o.b. Pittsburgh	3.10c.
No. 24, f.o.b. Gary	3.20c.
No. 24, del'd Phila.	3.41c.
No. 24, f.o.b. Birmingham	3.25c.
No. 24, f.o.b. cars dock Pacific ports	3.70c.
No. 24, wrought iron, Pittsburgh	4.95c.

Long Ternes

No. 24, unassorted 8-lb. coating f.o.b. Pittsburgh	3.40c.
F.o.b. Gary	3.50c.
F.o.b. cars dock Pacific ports	4.10c.

Vitreous Enameling Stock

No. 20, f.o.b. Pittsburgh	3.10c.
No. 20, f.o.b. Gary	3.20c.
No. 20, f.o.b. Birmingham	3.70c.
No. 20, f.o.b. cars dock Pacific ports	3.70c.
No. 10, f.o.b. Pittsburgh	2.50c.
No. 10, f.o.b. Gary	2.60c.
No. 10, f.o.b. Birmingham	3.10c.
No. 10, f.o.b. cars dock Pacific ports	3.10c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh	2.75c.
No. 28, Gary	2.85c.
No. 28, cars dock Pacific Coast ports	3.35c.

Tin Plate

	Per Base Box
Standard cokes, f.o.b. P'gh district mill	$5.25
Standard cokes, f.o.b. Gary	5.35
Standard cokes, f.o.b. cars dock Pacific ports	5.90

Terne Plate

(F.o.b. Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.00
15-lb. coating I.C.	12.00
20-lb. coating I.C.	13.00
25-lb. coating I.C.	14.00
30-lb. coating I.C.	15.25
40-lb. coating I.C.	17.50

Hot-Rolled Hoops, Bands, Strips and Flats under ¼ In.

	Base per Lb.
All widths up to 24 in., P'gh	1.85c.
All widths up to 24 in., Chicago	1.95c.
All widths up to 24 in., del'd Detroit	2.05c.
All widths up to 24 in., Birmingham	2.00c.
Cooperage stock, Pittsburgh	1.95c.
Cooperage stock, Chicago	2.05c.

Cold-Rolled Strips

	Base per Lb.
F.o.b. Pittsburgh	2.60c.
F.o.b. Cleveland	2.60c.
Del'd Chicago	2.895c.
F.o.b. Worcester	2.80c.

Fender Stock

No. 14, Pittsburgh or Cleveland	2.90c.
No. 14, Worcester	3.30c.
No. 20, Pittsburgh or Cleveland	3.30c.
No. 20, Worcester	3.70c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh and Cleveland.)

To Manufacturing Trade	*Per Lb.*
Bright wire	2.30c.
Spring wire	2.90c.

Chicago prices on products sold to the manufacturing trade are $1 a ton above Pittsburgh or Cleveland. Worcester and Duluth prices are $2 a ton above, Birmingham $3 above, and Pacific Coast prices $9 a ton above Pittsburgh or Cleveland.

To the Trade

	Base per Keg
Standard wire nails	$2.40
Smooth coated nails	2.40

	Base per 100 Lb.
Annealed fence wire	$2.45
Galvanized fence wire	2.80
Polished staples	3.10
Galvanized staples	3.35
Barbed wire, galvanized	2.80
Twisted barbless wire	2.80
Woven wire fence, base column	61.00
Single loop bale ties, base column	53.00

Chicago and Anderson, Ind., mill prices are $1 a ton over Pittsburgh base (on all products except woven wire fence, for which the Chicago price is $2 above Pittsburgh); Duluth, Minn., and Worcester, Mass., mill prices are $2 a ton over Pittsburgh (except for woven wire fence at Duluth, which is $3 over Pittsburgh), and Birmingham mill prices are $3 a ton over Pittsburgh.

On wire nails, barbed wire, staples and fence wire, prices at Houston, Galveston and Corpus Christi, Tex., New Orleans, Lake Charles, La., and Mobile, Ala., are $6 a ton over Pittsburgh, while Pacific Coast prices are $8 over Pittsburgh. Exception: on fence wire Pacific Coast prices are $11 a ton above Pittsburgh.

On staples and barbed wire, prices of $6 a ton above Pittsburgh are also quoted at Beaumont and Orange, Tex.

Wire Hoops, Twisted or Welded

	Off List
F.o.b. Pittsburgh	45 off
F.o.b. Chicago	43½ off

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel Inches	Black	Galv.	*Wrought Iron* Inches	Black	Galv.
⅛	51½	29½	⅛	+91½	+138
¼ to ⅜	53½	35	¼ & ⅜	+1½	+21½
½	58½	47	½	31½	15
¾	62	52	¾	36½	20½
1 to 3	64	55	1 & 1¼	39½	25½
			1½	43½	28
			2	41½	26

Lap Weld

2	60	51	2	37	22½
2½ to 3	63	54	2½ to 3½	38	25
3½ to 6	65	56	4 to 8	40	28½
7 and 8	64	54	9 to 12	38	24½
9 and 10	63½	53½			
11 and 12	62½	52½			

Butt Weld, extra strong, plain ends

¼	48½	33½	⅛	+13	+45½
¼ to ⅜	51	38	¼ & ⅜	+2½	+34½
½	56½	47½	½	32½	17½
¾	61	52	¾	37½	22½
1 to 3	63	55	1 to 2	43½	29

Lap Weld, extra strong, plain ends

2	58	50	2	40	26
2½ to 3	62	54	2½ to 4	45½	33
3½ to 6	65½	57½	4½ to 6	45	33½
7 and 8	64½	54½	7 & 8	46	33
9 and 10	63½	53½	9 to 12	41½	30
11 and 12	62½	52½			

On standard steel pipe an extra 5% off is allowed on sales to consumers while two 5's off apply on sales to jobbers. On less-than-carload shipments prices are determined by adding 20 and 25% and the carload freight rate to the base card. On structural steel pipe the base card is reduced 2 points and two 5's off are allowed to consumers and three 5's off to jobbers.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Seamless Steel Commercial Boiler Tubes and Locomotive Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

		Cold Drawn	Hot Rolled
1 in. o.d.	13 B.W.G.	$ 8.60	$ 7.82
1¼ in. o.d.	13 B.W.G.	10.19	9.26
1½ in. o.d.	13 B.W.G.	11.26	10.23
1¾ in. o.d.	13 B.W.G.	12.81	11.64
2 in. o.d.	13 B.W.G.	14.35	13.04
2¼ in. o.d.	13 B.W.G.	16.00	14.54
2½ in. o.d.	12 B.W.G.	17.61	16.07
2½ in. o.d.	12 B.W.G.	19.29	17.54
2¾ in. o.d.	12 B.W.G.	20.45	18.59
3 in. o.d.	12 B.W.G.	21.45	19.50
3½ in. o.d.	10 B.W.G.	41.08	37.35
3½ in. o.d.	11 B.W.G.	27.09	24.62
4 in. o.d.	10 B.W.G.	33.60	30.54
4½ in. o.d.	10 B.W.G.	41.08	37.35
5 in. o.d.	9 B.W.G.	51.56	46.87
6 in. o.d.	7 B.W.G.	79.15	71.90

Extras for less-carload quantities:

25,000 lb. or ft. to 39,999 lb. or ft.	5 %
12,000 lb. or ft. to 24,999 lb. or ft.	12½ %
6,000 lb. or ft. to 11,999 lb. or ft.	25 %
2,000 lb. or ft. to 5,999 lb. or ft.	35 %
Under 2,000 lb. or ft.	50 %

Lapweld Steel and Knobbled Charcoal Iron Pressure Tubes

(Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots)

		Steel	*Iron*
1½ in. o.d.	13 B.W.G.	$ 9.72	$20.16
1¾ in. o.d.	13 B.W.G.	11.06	21.84
2 in. o.d.	13 B.W.G.	12.38	17.23
2¼ in. o.d.	13 B.W.G.	13.79	19.58
2½ in. o.d.	12 B.W.G.	16.58	24.19
2½ in. o.d.	12 B.W.G.	17.54	26.40
3 in. o.d.	12 B.W.G.	18.35	28.39
3¼ in. o.d.	11 B.W.G.	21.56	33.95
3½ in. o.d.	11 B.W.G.	23.15	36.16
4 in. o.d.	10 B.W.G.	28.66	45.36
4½ in. o.d.	10 B.W.G.	35.22	50.48
5 in. o.d.	9 B.W.G.	44.25	61.86
6 in. o.d.	7 B.W.G.	68.14	102.46

Quantity Extras:

40,000 lb. or ft.	base
25,000 lb. or ft. to 39,999 lb. or ft.	plus 5%
10,000 lb. or ft. to 24,999 lb. or ft.	plus 12½ %
2,000 lb. or ft. to 9,999 lb. or ft.	plus 25%
Under 2,000 lb. or ft	plus 40%

CAST IRON WATER PIPE

	Per Net Ton
*6-in. and larger, del'd Chicago	$48.40
*4-in., del'd Chicago	51.40
6-in. and larger, del'd New York	45.20
4-in., del'd New York	48.20
*6-in. and larger, Birmingham	40.00
*4-in. Birmingham	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles	48.00
F.o.b. dock, Seattle	48.50
4-in., f.o.b. dock, San Francisco or Los Angeles	51.00
F.o.b. dock, Seattle	51.50
Class "A" and gas pipe, $3 extra.	

* Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $39, Birmingham, and $47.40, delivered Chicago, and 4-in. pipe, $42, Birmingham, and $50.40 a ton, delivered Chicago.

RAILROAD MATERIALS

Rails and Track Supplies

F.o.b. Mill

Standard rails, heavier than 60 lb. per gross ton	$36.37½
Angle bars, per 100 lb.	2.55

F.o.b. Code Basing Points

Light rails (from billets) per gross ton	$35.00
Light rails (from rail steel) per gross ton	34.00

	Base per 100 Lb.
Spikes, 9/16 in. and larger	$2.60
Spikes, ½ and smaller	2.60
Tie plates, steel	1.90
Tie plates, Pacific Coast ports	2.00
Track bolts, to steam railroads	3.60
Track bolts, no jobbers, all sizes (per 100 counts)	70 per cent off list

Basing points on light rails are Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Buffalo, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa.; on spikes alone, Cleveland, Youngstown, Lebanon, Pa., Columbia, Pa., Richmond, Va.

BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Per Cent Off List

Machine and carriage bolts:
½ in. x 6 in. and smaller..70, 10 and 5
Larger than ½ in.....70 and 10
Lag bolts .....70 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads .....70 and 10
Hot-pressed nuts, blank or tapped, square .....70 and 10
Hot-pressed nuts, blank or tapped, hexagon .....70 and 10
C.p.c. and t. square or hex. nuts, blank or tapped .....70 and 10
Semi-finished hexagon nuts, U.S.S. and S.A.E., all sizes to and incl. 1 in. diameter .....60, 20 and 15
Larger than 1 in. diameter..60, 20 and 15
Stove bolts in packages, Pittsburgh 72½ and 10
Stove bolts in packages, Chicago, 72½ and 10
Stove bolts in packages, Cleveland, 72½ and 10
Stove bolts in bulk, Pittsburgh.....82½
Stove bolts in bulk, Chicago.....82½
Stove bolts in bulk, Cleveland.....82½
Tire bolts 55

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh or Cleveland.....$2.90
F.o.b. Chicago 3.00
F.o.b. Birmingham 3.05

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh .....70 and 5
F.o.b. Cleveland .....70 and 5
F.o.b. Chicago and Birm'g'm.....70 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 65c. per 100 lbs. on lots of 200 lb. or more)

Per Cent Off List

Milled cap screws, 1 in. dia. and smaller .....80, 10 and 10
Milled standard set screws, case hardened, 1 in. dia. and smaller..... 75
Milled headless set screws, cut thread ¾ in. and smaller 75
Unset hex. head cap screws, U.S.S. or S.A.E. thread, 1 in. and smaller.. 85
Upset set screws, cut and oval points .....75 and 10
Milled studs .....65 to 65 and 10

Alloy and Stainless Steel

Alloy Steel Ingots

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Uncropped .....$40 per gross ton

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem.
Base price, $49 a gross ton.

Alloy Steel Bars

Price del'd Detroit is $52.
F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.
Open-hearth grade, base .....2.45c.
Delivered price at Detroit is.....2.60c.
S.A.E.

Series Numbers	Alloy Differential per 100 lb.
2000 (½% Nickel)	$0.25
2100 (2½% Nickel)	0.55
2300 (3½% Nickel)	1.50
2500 (5% Nickel)	2.25
3100 Nickel Chromium	0.55
3200 Nickel Chromium	1.35
3300 Nickel Chromium	3.80
3400 Nickel Chromium	3.20
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum (1.50 to 2.00 Nickel)	1.05
5100 Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100 Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100 Chromium Spring Steel	base
6100 Chromium Vanadium Bar	1.10c.
6100 Chromium Vanadium Spring Steel	0.70
Chromium Nickel Vanadium	1.40
Carbon Vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. The differential for cold-drawn bars ½c. per lb. higher with separate extras. Blooms, billets and slabs under 4x4 in. or equivalent are sold on the bar base. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base. Sections 4x4 in. to 10x10 in. or equivalent carry a gross ton price, which is the net price for bars for the same analysis. Larger sizes carry extras.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo. 2.95c. base per lb.

STAINLESS STEEL No. 302

(17 to 19% Cr. 7 to 9% NI. 0.08 to 0.20% C.)

(Base Prices f.o.b. Pittsburgh)

	Per Lb.
Forging billets	19.55c.
Bars	23c.
Plates	26c.
Structural shapes	23c.
Sheets	33c.
Hot-rolled strip	20¾c.
Cold-rolled strip	27c.
Drawn wire	23c.

Raw and Semi-Finished Steel

Billets, Blooms and Slabs

F.o.b. Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham.

Per Gross Ton

Rerolling $29.00
Forging quality 35.00

Delivered Detroit

Rerolling $32.00
Forging 38.00

Billets Only F.o.b. Duluth

Rerolling $31.00
Forging 37.00

Sheet Bars

F.o.b. Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

Per Gross Ton

Open-hearth or Bessemer.....$30.00

Skelp

F.o.b. Pittsburgh, Chicago, Youngstown, Buffalo, Coatesville, Pa., Sparrows Point, Md.

Per Lb.

Grooved ..... 1.80c.
Universal ..... 1.80c.
Sheared ..... 1.80c.

Wire Rods

(Common, base)

Per Gross Ton

F.o.b. Pittsburgh $40.00
F.o.b. Cleveland 40.00
F.o.b. Chicago 41.00
F.o.b. Anderson, Ind 41.00
F.o.b. Youngstown 41.00
F.o.b. Worcester, Mass. 42.00
F.o.b. Birmingham 43.00
F.o.b. San Francisco 49.00
F.o.b. Galveston 46.00

Pig Iron and Ferroalloys

PIG IRON

PRICES PER GROSS TON AT BASING POINTS

Basing Points	No. 2 Fdry.	Malleable	Basic	Bessemer
Everett, Mass.	$20.50	$21.00	$20.00	$21.50
Bethlehem, Pa.	20.50	21.00	20.00	21.50
Birdsboro, Pa.	20.50	21.00	20.00	21.50
Swedeland, Pa.	20.50	21.00	20.00	21.50
Steelton, Pa.	....	....	20.00	....
Sparrows Point, Md.	20.50	....	20.00	....
Neville Island, Pa.	19.50	19.50	19.00	20.00
Sharpsville, Pa.	19.50	19.50	19.00	20.00
Youngstown	19.50	19.50	19.00	20.00
Buffalo	19.50	20.00	18.50	20.50
Erie, Pa.	19.50	20.00	19.00	20.50
Cleveland	19.50	19.50	19.00	20.00
Toledo, Ohio	19.50	19.50	19.00	20.00
Jackson, Ohio	21.25	21.25	20.75	....
Detroit	19.50	19.50	19.00	20.00
Hamilton, Ohio	19.50	19.50	19.00	20.00
Chicago	19.50	19.50	19.00	20.00
Granite City, Ill.	19.50	19.50	19.00	....
Duluth, Minn.	20.00	20.00	....	20.50
Birmingham	15.50	15.50	14.50	20.00
Provo, Utah	17.50	....	17.00	....

DELIVERED PRICES PER GROSS TON AT CONSUMING CENTERS

	No. 2 Fdry.	Malleable	Basic	Bessemer
Boston Switching District From Everett, Mass.	$21.00	$21.50	$20.50	$22.00
Brooklyn From East, Pa.	22.9289	23.4289	....	....
Newark or Jersey City, N. J. From East, Pa.	21.9873	22.4873	21.4873	22.9873
Philadelphia From Eastern Pa.	21.3132	21.8132	20.8132	22.3132
Cincinnati From Hamilton, Ohio	20.5807	20.5807	20.0807	21.0807
Canton, Ohio From Cleveland and Youngstown	20.8482	20.8482	20.3482	21.3482
Columbus, Ohio From Hamilton, Ohio	21.64	21.64	....	....
Mansfield, Ohio From Cleveland and Toledo	21.3832	21.3832	20.8832	21.8832
Indianapolis From Hamilton, Ohio	21.9289	21.9289	....	....
South Bend, Ind. From Chicago	21.6935	21.6935	....	....
Milwaukee From Chicago	20.57	20.57	....	....
St. Paul From Duluth	21.94	....	....	....
Davenport, Iowa From Chicago	21.3832	21.3832	....	....
Kansas City From Granite City	22.2178	22.2178	....	....
San Francisco, Los Angeles or Seattle. From Provo	22.315	....	....	....

Delivered prices on Southern iron for shipment to Northern points are 38c. a gross ton below delivered prices from the nearest Northern basing points.

LOW PHOSPHORUS PIG IRON

Basing points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.....$24.00

GRAY FORGE PIG IRON

Valley furnace $19.00
Pittsburgh district furnace 19.00

CHARCOAL PIG IRON

Lake Superior furnace $22.00
Delivered Chicago 25.2528
Delivered Buffalo 25.595

CANADA

Pig Iron

Per gross ton:

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75.....$21.00
No. 2 fdy., sil. 1.75 to 2.75..... 20.50
Malleable 22.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75.....$22.50
No. 2 fdy., sil. 1.75 to 2.25..... 22.00
Malleable 22.50
Basic 22.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload) $75.00

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%.....$26.00
50-ton lots 3-mo. shipment..... 24.00
F.o.b. New Orleans 26.00

Electric Ferrosilicon

Per Gross Ton Delivered

50% (carloads) $77.50
50% (ton lots) 85.00
75% (carloads) 126.00
75% (ton lots) 136.00

Silvery Iron

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6.00 to 6.50%	$22.75	12%	$29.75
6.51 to 7.00%	23.25	13%	30.75
7.00 to 7.50%	23.75	14%	32.25
7.51 to 8.00%	24.25	15%	33.75
8.00 to 8.50%	24.75	16%	35.25
8.51 to 9.00%	25.25	17%	36.75
9.00 to 9.50%	25.75		
9.51 to 10.00%	26.25		
10.00 to 10.50%	26.75		
10.51 to 11.00%	27.25		
11.00 to 11.50%	27.75		
11.51 to 12.00%	28.25		

The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Bessemer Ferrosilicon

F.o.b. Jackson, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10.00 to 10.50%	$27.75	13%	$31.75
10.51 to 11.00%	28.15	14%	33.25
11.00 to 11.50%	28.75	15%	34.75
11.51 to 12.00%	29.25	16%	36.25
12%	30.25	17%	37.75

Manganese 2 to 3%, $1 a ton additional. For each unit of manganese over 3%, $1 a ton additional. Phosphorus 0.75% or over, $1 ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Other Ferroalloys

Ferrotungsten, per lb. contained W. del., carloads $1.30
Ferrotungsten, lots of 5000 lb..... 1.40
Ferrotungsten, smaller lots 1.45
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr per lb. contained Cr delivered, in car loads ..... 10.00c.
Ferrochromium, 2% carbon .....16.50c. to 17.00c.
Ferrochromium, 1% carbon .....17.50c. to 18.00c.
Ferrochromium, 0.10% carbon .....19.50c. to 20.00c.
Ferrochromium, 0.06% carbon .....20.00c. to 20.50c.
Ferrovanadium, del. per lb. contained V. .....$2.70 to $2.90
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y. $2.50
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton..$137.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton... 142.50
Ferrophosphorus, electric, or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18% with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton 58.50
Ferrophosphorus, electric, 24%, in carlots, f.o.b. Anniston, Ala., per gross ton with $3 unitage, freight equalized with Nashville, Tenn. 75.00
Ferromolybdenum, per lb. Mo. del. 95c.
Calcium molybdate, per lb. Mo. del. ..... 80c.
Silico spiegel, per ton, f.o.b. furnace, carloads $38.00
Ton lots or less, per ton..... 45.50
Silico-manganese, gross ton, delivered,
2.50% carbon grade 85.00
2% carbon grade 90.00
1% carbon grade 100.00
Spot prices .....$5 a ton higher

Iron and Steel Scrap

PITTSBURGH

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$15.25 to $14.75
No. 2 heavy melting steel	13.00 to 13.50
No. 2 railroad wrought	14.25 to 14.75
Scrap rails	14.50 to 15.00
Rails, 3 ft. and under	15.50 to 16.00
Compressed sheet steel	14.25 to 14.75
Hand bundled sheet steel	13.00 to 13.50
Hvy. steel axle turnings	13.00 to 13.50
Machine shop turnings	10.00 to 10.50
Short shov. turnings	10.00 to 10.50
Short mixed borings and turnings	8.50 to 9.50
Cast iron borings	8.50 to 9.50
Cast iron carwheels	14.00 to 14.50
Heavy breakable cast	12.50 to 13.00
No. 1 cast	14.00 to 14.50
Railr. knuckles and couplers	16.25 to 16.75
Rail. coil and leaf springs	16.25 to 16.75
Rolled steel wheels	16.25 to 16.75
Low phos. billet crops	16.75 to 17.25
Low phos. sheet bar crops	16.50 to 17.00
Low phos. punchings	16.00 to 16.50
Low phos. plate scrap	15.25 to 15.75
Steel car axles	15.00 to 15.00

CHICAGO

Delivered Chicago district consumers:

	Per Gross Ton
Heavy melting steel	$13.25 to $13.75
Automobile hvy. melt steel	11.50 to 12.00
Shoveling steel	13.25 to 13.75
Hydraulic comp. sheets	12.25 to 12.75
Drop forge flashings	10.75 to 11.25
No. 1 busheling	12.00 to 12.50
Rolled carwheels	14.00 to 14.50
Railroad tires	14.00 to 14.50
Railroad leaf springs	14.00 to 14.50
Axle turnings	12.50 to 13.00
Steel couplers and knuckles	14.00 to 14.50
Coil springs	15.00 to 15.50
Axle turnings (elec. fur.)	13.25 to 13.75
Low phos. punchings	14.75 to 15.25
Low phos. plates, 12 in. and under	15.50 to 16.00
Cast iron borings	6.00 to 6.50
Short shoveling turnings	7.50 to 8.00
Machine shop turnings	6.50 to 7.00
Rerolling rails	14.50 to 15.00
Steel rails, less than 3 ft.	15.00 to 15.50
Steel rails, less than 2 ft.	15.75 to 16.25
Angle bars, steel	14.50 to 15.00
Cast iron carwheels	13.00 to 13.50
Railroad malleable	16.00 to 16.50
Agricultural malleable	14.50 to 15.00

	Per Net Ton
Iron car axles	$16.00 to $16.50
Steel car axles	14.50 to 15.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	11.75 to 12.25
No. 2 busheling, old	6.50 to 7.00
Locomotive tires, smooth	12.00 to 12.50
Pipes and flues	7.00 to 7.50
No. 1 machinery cast	12.00 to 12.50
Clean automobile cast	11.00 to 11.50
No. 1 railroad cast	10.75 to 11.25
No. 1 agricultural cast	10.25 to 10.75
Stove plate	7.50 to 8.00
Grate bars	8.50 to 9.00
Brake shoes	9.00 to 9.50

PHILADELPHIA

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$12.50 to $13.00
No. 2 heavy melting steel	11.25 to 11.75
Hydraulic compressed new	11.50 to 12.00
Hydraulic compressed, old	8.50 to 9.00
Steel rails for rolling	14.50 to 15.00
Cast iron carwheels	14.50 to 15.00
Heavy breakable cast	12.00 to 12.50
No. 1 cast	13.00 to 13.50
Stove plate (steel works)	10.00 to 10.50
Railroad malleable	16.00 to 16.50
Machine shop turnings	7.75 to 8.25
No. 1 blast furnace	6.25
Cast borings	6.00
Heavy axle turnings	9.50 to 10.00
No. 1 low phos. heavy	15.00 to 16.00
Couplers and knuckles	15.75 to 16.25
Rolled steel wheels	15.75 to 16.25
Steel axles	16.50 to 17.00
Shafting	18.25 to 18.75
No. 1 railroad wrought	13.00 to 13.50
Spec. iron and steel pipe	10.00 to 10.50
Bundled sheets	10.50 to 11.00
No. 1 forge fire	10.50 to 11.00
Cast borings (chem.)	10.50 to 13.00

CINCINNATI

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$11.00 to $11.50
No. 2 heavy melting steel	9.00 to 9.50
Scrap rails for melting	10.50 to 11.00
Loose sheet clippings	7.00 to 7.50
Bundled sheets	8.00 to 8.50
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.75 to 7.25
No. 1 busheling	8.50 to 9.00
No. 2 busheling	4.25 to 4.75
Rails for rolling	11.00 to 11.50
No. 1 locomotive tires	9.50 to 10.00
Short rails	14.00 to 14.50
Cast iron carwheels	10.50 to 11.00
No. 1 machinery cast	11.50 to 12.00
No. 1 railroad cast	10.75 to 11.25
Burnt cast	7.75 to 8.25
Stove plate	7.75 to 8.25
Agricultural malleable	9.75 to 10.25
Railroad malleable	11.50 to 12.00

CLEVELAND

Per gross ton delivered consumers' yards:

No. 1 heavy melting steel	$13.25 to $13.50
No. 2 heavy melting steel	12.25 to 12.50
Compressed sheet steel	12.75 to 13.00
Light bundled sheet stampings	9.75 to 10.25
Drop forge flashings	12.00 to 12.50
Machine shop turnings	7.50 to 8.00
Short shoveling turnings	8.50 to 9.00
No. 1 busheling	12.00 to 12.50
Steel axle turnings	10.75 to 11.25
Low phos. billet crops	16.50 to 17.00
Cast iron borings	8.50 to 9.00
Mixed borings and short turnings	8.50 to 9.00
No. 2 busheling	8.50 to 9.00
No. 1 cast	14.50 to 15.00
Railroad grate bars	8.00 to 8.50
Stove plate	9.00 to 9.50
Rails under 3 ft.	16.50 to 17.00
Rails for rolling	15.50 to 16.00
Railroad malleable	16.50 to 17.00
Cast iron carwheels	12.75 to 13.00

BUFFALO

Per gross ton, f.o.b. Buffalo consumers' plants:

No. 1 heavy melting steel	$12.25 to $12.75
No. 2 heavy melting scrap	11.25 to 11.75
Scrap rails	12.25 to 12.75
New hydraul. comp. sheets	11.25 to 11.75
Old hydraul. comp. sheets	9.25 to 9.75
Drop forge flashings	11.25 to 11.75
No. 1 busheling	11.25 to 11.75
Hvy. steel axle turnings	10.50 to 11.00
Machine shop turnings	6.50 to 7.00
Knuckles and couplers	13.00 to 14.00
Coil and leaf springs	13.00 to 14.00
Rolled steel wheels	13.00 to 14.00
Low phos. billet crops	14.50 to 15.00
Short shov. steel turnings	7.75 to 8.25
Short mixed borings and turnings	7.75 to 8.25
Cast iron borings	7.75 to 8.25
No. 2 busheling	7.00 to 7.50
Steel car axles	12.50 to 13.00
Iron axles	12.50 to 13.00
No. 1 machinery cast	12.50 to 13.00
No. 1 cupola cast	11.50 to 12.00
Stove plate	10.00 to 10.50
Steel rails, 3 ft. and under	14.50 to 15.00
Cast iron carwheels	12.00 to 12.50
Railroad malleable	15.00 to 15.50
Chemical borings	9.00 to 9.50

BOSTON

Dealers' buying prices per gross ton:

*No. 1 heavy melting steel	$10.25
No. 1 heavy melting steel	9.75
*Scrap rails	10.25
Scrap rails	$8.00 to 8.25
*No. 2 steel	9.00 to 9.25
No. 2 steel	8.75
Breakable cast	6.75 to 7.00
*Machine shop turnings	5.50 to 5.75
Machine shop turnings	3.40 to 3.75
Bundled skeleton, long	6.75 to 7.15
Shafting	13.00 to 13.25
Engine blocks, stripped	8.00 to 8.25
Cast iron borings, chemical	5.00 to 7.00
Cotton ties	5.50 to 6.00
*Stove plate	7.00

Per gross ton delivered consumers' yards:

Textile cast	$8.50 to $10.00
No. 1 machinery cast	8.50 to 10.50
Stove plate	6.50 to 7.00

* Delivered local army base.

NEW YORK

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	†$9.00 to $9.50
No. 2 heavy melting steel	†8.00 to 8.50
Heavy breakable cast	7.00 to 7.50
No. 1 machinery cast	8.00 to 8.50
No. 2 cast	*7.50 to *7.75
Stove plate	*6.75 to *7.00
Steel car axles	13.50 to 14.00
Shafting	13.50 to 13.75
No. 1 railroad wrought	8.50 to 9.00
No. 1 yard wrought long	7.50 to 8.00
Spec. iron and steel pipe	6.00 to 6.50
Forge fire	6.50 to 7.00
Rails for rolling	9.50 to 10.50
Short shoveling turnings	3.50 to 4.00
Machine shop turnings	4.00 to 4.50
Cast borings	3.00 to 3.50
No. 1 blast furnace	3.00 to 3.50
Cast borings (chemical)	10.00 to 11.00
Unprepared yard iron and steel	4.50 to 5.00

Per gross ton, delivered local foundries:

No. 1 machinery cast	$11.00
No. 1 hvy. cast (cupola size)	9.50
No. 2 cast	8.00

† Loading on barge.
*50c. higher offered at nearby New Jersey points.

BIRMINGHAM

Per gross ton delivered consumers' yards:

Heavy melting steel	$9.50 to $10.00
Scrap steel rails	11.00 to 11.50
Short shoveling turnings	7.00
Stove plates	7.00
Steel axles	11.50 to 12.00
Iron axles	11.50
No. 1 railroad wrought	8.50
Rails for rolling	12.50
No. 1 cast	10.50 to 11.00
Tramcar wheels	10.00 to 10.50

ST. LOUIS

Dealers' buying prices per gross ton delivered consumers' works:

Selected heavy steel	$11.00 to $11.50
No. 1 heavy melting	11.00 to 11.50
No. 2 heavy melting	9.50 to 10.00
No. 1 locomotive tires	9.75 to 10.25
Misc. stand-sec. rails	11.50 to 12.00
Railroad springs	12.00 to 12.50
Bundled sheets	7.50 to 8.00
No. 2 railroad wrought	11.00 to 11.50
No. 1 busheling	6.50 to 7.00
Cast iron borings and shoveling turnings	4.00 to 4.50
Rails for rolling	12.50 to 13.00
Machine shop turnings	4.00 to 4.50
Heavy turnings	9.00 to 9.50
Steel car axles	12.50 to 13.00
Iron car axles	15.00 to 16.00
No. 1 railroad wrought	10.00 to 10.50
Steel rails less than 3 ft.	13.50 to 14.00
Steel angle bars	12.50 to 13.00
Cast Iron carwheels	10.50 to 11.00
No. 1 machinery cast	11.25 to 11.50
Railroad malleable	13.25 to 13.75
No. 1 railroad cast	10.50 to 11.00
Stove plate	7.50 to 8.00
Agricult. malleable	11.75 to 12.25

DETROIT

Dealers' buying prices per gross ton:

No. 1 heavy melting steel	$10.00 to $10.50
No. 2 heavy melting steel	$9.00 to $9.50
Borings and short turnings	5.50 to 6.00
Long turnings	5.75 to 6.25
No. 1 machinery cast	13.50 to 14.00
Automotive cast	13.50 to 14.00
Hydraulic comp. sheets	10.50 to 11.00
Stove plate	8.25 to 8.75
New factory busheling	9.50 to 10.00
Old No. 2 busheling	5.25 to 5.75
Sheet clippings	7.50 to 8.00
Flashings	9.25 to 9.75
Low phos. plate scrap	10.25 to 10.75

CANADA

Dealers' buying prices per gross ton:

	Toronto	Montreal
Heavy melting steel	$8.00	$7.50
Rails, scrap	8.50	8.00
Machine shop turnings	3.50	3.50
Boiler plate	5.00	5.00
Heavy axle turnings	4.50	4.00
Cast borings	4.50	4.00
Steel borings	3.00	3.00
Wrought pipe	4.00	4.00
Steel axles	8.00	8.50
Axles, wrought iron	8.00	8.50
No. 1 machinery cast	9.50	9.00
Stove plate	6.50	6.00
Standard carwheels	7.75	7.00
Malleable	7.50	7.00

ORES, FLUORSPAR, COKE, FUEL, REFRACTORIES

Lake Superior Ores

Delivered Lower Lake Ports

	Per Gross Ton
Old range, Bessemer, 51.50% iron	$4.80
Old range, non-Bessemer, 51.50% iron	4.65
Mesabi, Bessemer 51.50% iron	4.65
Mesabi, non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore

C.i.f. Philadelphia or Baltimore

	Per Unit
Iron, low phos., copper free, 55 to 58% iron dry Spanish or Algeria	10.25c.
Iron, low phos., Swedish, average 68½% iron	10.25c.
Iron, basic or foundry, Swedish, aver. 65% iron	9.50c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Manganese, Caucasian, washed 52%	26c.
Manganese, African, Indian, 44-48%	25c.
Manganese, African, Indian, 49-51%	26c.
Manganese, Brazilian, 46 to 48½%	24c.

	Per Net Ton Unit
Tungsten, Chinese, wolframite, duty paid, delivered	$15.75 to $16.00
Tungsten, domestic, scheelite delivered	15.75 to 16.00

	Per Gross Ton
Chrome, 45% Cr_2O_3, lump, c.i.f. Atlantic Seaboard (African)	$17.50
45 to 46% Cr_2O_3 (Turkish)	$16.50 to $17.00
48% Cr_2O_3 (African)	20.50
48% min. Cr_2O_3 (Turkish)	19.25
Chrome concentrate, 50% and over Cr_2O_3, c.i.f. Atlantic Seaboard	22.00
52% Cr_2O_3 (Turkish)	21.75
48 to 49% Cr_2O_3 (Turkish)	19.25

Fluorspar

	Per Net Ton
Domestic, washed gravel, 85-5, f.o.b. Kentucky and Illinois mines for all rail shipment	$16.00
Same grade for Ohio River barge shipment for Kentucky and Illinois River landings	17.50
No. 2 lump, 85-5, f.o.b. Kentucky and Illinois mines	18.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	20.00
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	30.00

COKE, COAL AND FUEL OIL

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville Prompt	$3.65 to $3.80
Foundry, f.o.b. Connellsville Prompt	4.25 to 5.75
Foundry, by-product, Chicago ovens, for delivery outside switching district	9.00
Foundry, by-product, delivery in Chicago switching district	9.75
Foundry, by-product, New England, delivered	11.50
Foundry, by-product, Newark or Jersey City, del'd	9.65
Foundry, by-product, Phila.	9.38
Foundry, by-product, Cleveland, delivered	9.75
Foundry, by-product, Cincinnati, del'd	9.50
Foundry, Birmingham	$6.50
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00
Foundry, from Birmingham, f.o.b. cars docks, Pacific ports	14.75

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.50 to $1.75
Mine run coking coal, f.o.b. W. Pa.	1.90 to 2.10
Gas coal, ¾-in. f.o.b. Pa. mines	2.00 to 2.25
Mine run gas coal, f.o.b. Pa. mines	1.80 to 2.00
Steam slack, f.o.b. W. Pa. mines	0.90 to 1.15
Gas slack, f.o.b. W. Pa. mines	1.20 to 1.45

Fuel Oil

	Per Gal. f.o.b. Bayonne, N. J.
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal. f.o.b. Baltimore
No. 3 distillate	4.25c.
No. 4 industrial	3.87½c.

	Per Gal del'd Chicago
No. 3 industrial fuel oil	5.00c.
No. 5 industrial fuel oil	3.77c.

	Per Gal. f.o.b. Cleveland
No. 3 distillate	5.50c.
No. 4 industrial	5.25c.
No. 5 industrial	4.25c.

REFRACTORIES

Fire Clay Brick

	Per 1000 f.o.b. Works	
	High-heat Duty Brick	Intermediate Duty Brick
Pennsylvania	$45.00	$40.00
Maryland	45.00	40.00
New Jersey	50.00	43.00
Ohio	45.00	40.00
Kentucky	45.00	40.00
Missouri	45.00	40.00
Illinois	45.00	40.00
Ground fire clay, per ton	7.00	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$45.00
Chicago District	54.00
Birmingham	55.00
Silica cement per net ton	8.00

Chrome Brick

	Per Net Ton
Standard f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	$45.00
Chemically bonded f.o.b. Baltimore, Plymouth Meeting and Chester, Pa.	45.00

Magnesite Brick

	Per Net Ton
Standard, f.o.b. Baltimore and Chester, Pa.	$65.00
Chemically bonded, f.o.b. Baltimore	55.00

Grain Magnesite

	Per Net Ton
Imported, f.o.b. Baltimore and Chester, Pa.	$45.00
Domestic, f.o.b. Baltimore and Chester, in sacks	40.00
Domestic, f.o.b. Chewelah, Wash.	22.00

Warehouse Prices for Steel Products

PITTSBURGH

	Base per Lb.
Plates	3.15c.
Structural shapes	3.15c.
Soft steel bars and small shapes	2.95c.
Reinforcing steel bars	2.90c.
Cold-finished and screw stock:	
Rounds and hexagons	3.35c.
Squares and flats	3.35c.
Hoops and bands under ¼ in.	3.20c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.30c.
Galv. sheets (No. 24), 25 or more bundles	3.95c.
Hot-rolled sheets (No. 10)	2.95c.
Galv. corrug. sheets (No. 28), per square (more than 3750 lb.)	$3.69
Spikes, large	2.90c.
Track bolts, all sizes, per 100 count, 65 per cent off list.	
Machine bolts, 100 count, 65 per cent off list.	
Carriage bolts, 100 count, 65 per cent off list.	
Nuts, all styles, 100 count, 65 per cent off list.	
Large rivets, base per 100 lb.	$3.50
Wire, black, soft ann'l'd, base per 100 lb.	*2.70
Wire, galv. soft, base per 100 lb.	*2.925
Common wire nails, per keg	*2.834
Cement coated nails, per keg	*2.834

On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applies to orders of 400 to 9999 lbs.

*Delivered in Pittsburgh switching district.

CHICAGO

	Base per Lb.
Plates and structural shapes	3.20c.
Soft steel bars, rounds	3.00c.
Soft steel bars, squares and hexagons	3.15c.
Cold-fin. steel bars:	
Rounds and hexagons	3.50c.
Flats and squares	3.50c.
Hot-rolled strip	3.30c.
Hot-rolled annealed sheets (No. 24)	3.85c.
Galv. sheets (No. 24)	4.55c.
Hot-rolled sheets (No. 10)	3.05c.
Spikes (keg lots)	3.50c.
Track bolts (keg lots)	4.65c.
Rivets, structural (keg lots)	3.65c.
Rivets, boiler (keg lots)	3.75c.
	Per Cent Off List
Machine bolts	*70
Carriage bolts	*70
Lag screws	*70
Hot-pressed nuts, sq. tap or	
Hot-pressed nuts, sq. tap or blank	*70
Hot-pressed nuts, hex. tap or	
Hot-pressed nuts, hex. tap or blank	*70
Hex. head cap screws	87½
Cut point set screws	75 and 10
Flat head bright wood screws	70
Spring cotters	55
Stove bolts in full packages	70
Rd. hd. tank rivets, 7/16 in. and smaller	57½
Wrought washers	$4.50 off list
Black ann'l'd wire per 100 lb.	$3.85
Com. wire nails, base per keg	2.95†
Cement c't'd nails, base per keg	2.95†

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. All prices are f.o.b. consumers' plants within the Chicago switching district.

*These are quotations delivered to city trade for quantities of 100 lb. or more. For lots of less than 100 lb., the quotation is 65 per cent off. Discounts applying to country trade are 70 per cent off, f.o.b. Chicago, with full or partial freight allowed up to 50c. per 100 lb.

†Prices for city and suburbs only.

NEW YORK

	Base per Lb.
Plates, ¼ in. and heavier	3.40c.
Structural shapes	3.37c.
Soft steel bars, rounds	3.31c
Iron bars	3.31c.
Iron bars, swed. charcoal	6.75c. to 7.00c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.81c.
Flats and squares	3.81c.
Cold-rolled: strip, soft and quarter hard	3.36c.
Hoops	3.56c.
Bands	3.56c.
Hot-rolled sheets (No. 10)	3.31c.
Hot-rolled ann'l'd sheets (No. 24*)	3.89c.
Galvanized sheets (No. 24*)	special
Long terne sheets (No. 24)	5.25c.
Standard tool steel	11.00c.
Wire, black annealed (No. 10)	3.40c.
Wire, galv. (No. 10)	3.75c.
Tire steel, 1 x ½ in. and larger	3.75c.
Open hearth spring steel	4.00c. to 10.00c.
Common wire nails, base, per keg	$3.21
	Per Cent Off List
Machine bolts, square head and nut:	
All diameters	65 and 10
Carriage bolts, cut thread:	
All diameters	65 and 10
Boiler tubes:	Per 100 Ft.
Lap welded, 2-in.	$18.05
Seamless welded, 2-in.	19.24
Charcoal iron, 2-in.	24.94
Charcoal iron, 4-in.	63.65

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

ST. LOUIS

	Base per Lb.
Plates and struc. shapes	3.45c.
Bars, soft steel (rounds and flats)	3.25c.
Bars, soft steel (squares, hexagons, ovals, half ovals and half rounds)	3.40c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Hot-rolled annealed sheets (No. 24)	4.10c.
Galv. sheets (No. 24)	4.65c.
Hot-rolled sheets (No. 10)	3.30c.
Black corrug. sheets (No. 24)	4.10c.
*Galv. corrug. sheets	4.65c.
Structural rivets	4.00c.
Boiler rivets	4.10c.
	Per Cent Off List
Tank rivets, 7/16 in. and smaller	55
Machine and carriage bolts, lag screws, fitting up bolts, bolt ends, plow bolts, hot-pressed nuts, square and hexagon, tapped or blank, semi-finished nuts:	
All quantities	70

*No. 26 and lighter take special prices.

PHILADELPHIA

	Base per Lb.
*Plates, ¼-in. and heavier	2.98c.
*Structural shapes	2.98c.
*Soft steel bars, small shapes, iron bars (except bands)	3.03c.
‡Reinforc. steel bars, sq. twisted and deformed	2.96c.
Co'd-finished steel bars	3.76c.
*Steel hoops	3.43c.
*Steel bands, No. 12 and 3/16 in. incl.	3.18c.
Spring steel	5.00c.
†Hot-rolled anneal. sheets (No. 24)	3.65c.
†Galvanized sheets (No. 24)	4.40c.
*Hot-rolled annealed sheets (No. 10)	3.08c.
Diam. pat. floor plates, ¼ in.	4.95c.
Swedish iron bars	6.25c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

*Base prices subject to deduction on orders aggregating 4000 lb. or over.

†For 50 bundles or over.

‡For less than 2000 lb.

CLEVELAND

	Base per Lb.
Plates and struc. shapes	3.31c.
Soft steel bars	3.00c.
Reinfore. steel bars	2.10c.
†Cold-finished steel bars	3.50c.
Flat-rolled steel under ¼ in.	3.36c.
Cold-finished strip	†3.00c.
Hot-rolled annealed sheets (No. 24)	3.91c.
Galvanized sheets (No. 24)	4.61c.
Hot-rolled sheets (No. 10)	3.11c.
Hot-rolled 3/16 in. 24 to 48 in. wide sheets	3.56c.
*Black ann'l'd wire, per 100 lb.	$2.75
*No. 9 galv. wire, per 100 lb.	3.10
*Com. wire nails, base per keg	2.70

†Outside delivery 10c. less.

*For 5000 lb. or less.

CINCINNATI

	Base per Lb.
Plates and struc. shapes	3.42c.
Bars, rounds, flats and angles	3.22c.
Other shapes	3.37c.
Rail steel reinforc. bars	3.25c.
Hoops and bands, 3/16 in. and lighter	3.47c.
Cold-finished bars	3.72c.
Hot-rolled annealed sheets (No. 24)	4.02c.
Galv. sheets (No. 24)	4.72c.
Hot-rolled sheets (No. 10)	3.22c.
Structural rivets	4.35c.
Small rivets, 55 per cent off list	
No. 9 ann'l'd wire, per 100 lb. (1000 lb. or over)	$2.88
Com. wire nails, base per keg:	
Any quantity less than carload	3.04
Cement c't'd nails, base 100-lb. keg	3.50
Chain, lin. per 100 lb.	8.35
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$20.37
4-in.	48.14
Lap-welded steel boiler tubes, 2-in.	19.38
4-in.	45.32

BUFFALO

	Base per Lb.
Plates	3.38c.
Struc. shapes	3.25c.
Soft steel bars	3.05c.
Reinforcing bars	2.60c.
Cold-fin. flats and sq.	3.55c.
Rounds and hex.	3.55c.
Cold-rolled strip steel	3.19c.
Hot-rolled annealed sheets (No. 24)	4.06c.
Heavy hot-rolled sheets (3/16 in., 24 to 48 in. wide)	3.63c.
Galv. sheets (No. 24)	4.70c.
Bands	3.43c.
Hoops	3.43c.
Heavy hot-rolled sheets	3.18c.
Com. wire nails, base per keg	$3.35
Black wire, base per 100 lb. (2500-lb. lots or under)	3.55
(Over 2500 lb.)	3.45

BOSTON

	Base per Lb.
Beams, channels, angles, tees, zees	3.54c.
H beams and shapes	3.54c.
Plates—Sheered, tank and univ. mill, ¼ in. thick and heavier	3.56c.
Floor plates, diamond pattern	5.36c.
Bar and bar shapes (mild steel)	3.15c.
Bands 3/16 in. thick and No. 12 ga. incl.	3.65c. to 4.65c
Half rounds, half ovals, ovals and bevels	4.70c.
Tire steel	4.70c.
Cold-rolled strip steel	3.245c.
Cold-finished rounds, squares and hexagons	3.90c.
Cold-finished flats	3.90c.
Blue annealed sheets, No. 10 ga.	3.65c.
One pass cold-rolled sheets No. 24 ga.	4.20c.
Galvanized steel sheets, No. 24 ga.	4.90c.
Lead coated sheets, No. 24 ga.	5.85c.

Prices delivered by truck in metropolitan Boston, subject to quantity differentials.

DETROIT

	Base per Lb.
Soft steel bars	3.09c.
Structural shapes	3.42c.
Plates	3.42c.
Floor plates	5.17c.
Hot-rolled annealed sheets (No. 24)	3.94c.
Hot-rolled sheets (No. 10)	3.14c.
Galvanized sheets (No. 24)	4.72c.
Bands	3.39c.
Hoops	3.39c.
†Cold-finished bars	3.64c.
Cold-rolled strip	3.18c.
Hot-rolled alloy steel (S.A.E. 3100 Series)	5.29c.*
Bolts and nuts, in cases, 70 and 10 per cent off list	
Broken cases	70 per cent off

Prices delivered by truck in metropolitan Detroit, subject to quantity differentials.

*Price applies to 1,000 lb. and over.

†With reduction in chemical extras.

MILWAUKEE

	Base per Lb.
Plates and structural shapes	3.31c.
Soft steel bars, rounds up to 8 in., flats and fillet angles	3.11c.
Soft steel bars, squares and hexagons	3.26c.
Hot-rolled strip	3.41c.
Hot-rolled sheets (No. 10)	3.16c.
Hot-rolled annealed sheets (No. 24)	3.96c.
Galvanized sheets (No. 20)	4.66c.
Cold-finished steel bars	3.61c.
Cold-rolled strip	3.33c.
Structural rivets (keg lots)	3.86c.
Boiler rivets, cone head (keg lots)	3.96c.
Track spikes (keg lots)	3.71c.
Track bolts (keg lots)	4.86c.
Black annealed wire	3.15c.
Com. wire nails	2.85c.
Cement coated nails	2.85c.
	Per Cent Off List
Machine bolts	70 and 10
Carriage bolts	70 and 10
Hot-pressed nuts, sq. and hex. tapped or blank (keg lots)	70 and 10

Prices given above are delivered Milwaukee.

On plates, shapes, bars, hot-rolled strip and heavy hot-rolled sheets, the base applies on orders of 400 to 9999 lb. On galvanized and No. 24 hot-rolled annealed sheets the prices given apply on orders of 400 to 1500 lb. On cold-finished bars the prices are for orders of 1000 lb. or more of a size.

ST. PAUL

	Base per Lb.
Mild steel bars, rounds	3.25c.
Structural shapes	3.45c.
Plates	3.45c.
Cold-finished bars	4.02c.
Bands and hoops	3.55c.
Hot-rolled annealed sheets, No. 24	3.90c.
Galvanized sheets, No. 24	4.50c.
Cold-rolled sheets, No. 20	4.95c.

On mild steel bars, shapes, plates and hoops and bands the base applies on 400 to 14,999 lb. On hot-rolled sheets, galvanized sheets and cold-rolled sheets base applies on 15,000 lb. and over. Base on cold-finished bars is 1000 lb. and over of a size.

BALTIMORE

	Base per Lb.
*Mild steel bars	3.00c.
**Reinforcing bars	2.85c.
*Structural shapes	3.00c.
†Plates	3.00c.
†Hot-rolled sheets, No. 10	3.10c.
‡Hot-rolled annealed sheets, No. 24	3.60c.
‡Galvanized sheets, No. 24	4.30c.
*Bands	3.30c.
*Hoops	3.45c.
§Cold-rolled rounds	3.58c.
§Cold-rolled squares, hex. and flats	3.58c.
Rivets	4.40c.
Bolts and nuts, per cent off list	60 and 10

*Quantity extras per size apply. †Quantity extras per thickness apply. Hot-rolled quantity extras are: 2000 lb. and over, base; 1500 lb. to 1999 lb. add 15c. per 100 lb.; 1000 lb. to 1499 lb., add 30c.; 0 to 999 lb., add 50c.

‡25 bundles and over, base. For 1 to 9 bundles add 50c. per 100 lb.; for 10 to 24 bundles add 25c.

§Base for 1000 lb. and over. For 500 to 999 lb. add 25c. per 100 lb.; for 300 to 499 lb. add $1.00; for 0 to 299 lb. add $1.75; for combined order under 100 lb. add $3.00.

**For orders 4000 lb. to 9999 lb. Add 15c. per 100 lb. for orders 2000 to 3999 lb.; add 65c. for orders less than 2000 lb.

CHATTANOOGA

	Base per Lb.
Mild steel bars	3.36c.
Iron bars	3.36c.
Reinforcing bars	3.36c.
Structural shapes	3.56c.
Plates	3.56c.
Hot-rolled sheets, No. 10	3.36c.
Hot-rolled annealed sheets, No. 24	4.16c.
Galvanized sheets, No. 24	4.86c.
Steel bands	3.61c.
Cold-finished bars	3.98c.

MEMPHIS

	Base per Lb.
Mild steel bars	3.47c.
Shapes, bar size	3.47c.
Iron bars	3.47c.
Structural shapes	3.67c.
Plates	3.67c.
Hot-rolled sheets, No. 10	3.47c.
Hot-rolled annealed sheets, No. 24	4.27c.
Galvanized sheets, No. 24	4.80c.
Steel bands	3.72c.
Cold-drawn rounds	3.89c.
Cold-drawn flats, squares, hexagons	5.80c.
Structural rivets	4.25c.
Bolts and nuts, per cent off list	65
Small rivets, per cent off list	50

NEW ORLEANS

	Base per Lb
Mild steel bars	3.35c.
Reinforcing bars	3.50c.
Structural shapes	3.55c.
Plates	3.55c.
Hot-rolled sheets, No. 10	3.55c.
Hot-rolled annealed sheets, No. 24	4.50c.
Galvanized sheets, No. 24	4.95c.
Steel bands	3.95c.
Cold-finished steel bars	4.30c.
Structural rivets	4.25c.
Boiler rivets	4.25c.
Common wire nails, base per keg	$2.95
Bolts and nuts, per cent off list	70

PACIFIC COAST

	Base per Lb. San Francisco	Los Angeles	Seattle
Plates, tank and U. M.	3.25c.	3.60c.	3.55c.
Shapes, standard	3.25c.	3.60c.	3.55c.
Soft steel bars	3.25c.	3.60c.	3.70c.
Reinforcing bars, f.o.b. cars dock Pacific ports	2.45c.	2.45c.	2.45c.
Hot-rolled annealed sheets (No. 24)	4.00c.	4.35c.	4.40c.
Hot-rolled sheets (No. 10)	3.35c.	3.70c.	3.75c.
Galv. sheets (No. 24)	4.50c.	4.95c.	5.00c.
Cold finished steel Rounds	5.80c.	5.85c.	6.00c.
Squares and hexagons	7.05c.	7.10c.	7.25c.
Flats	7.55c.	7.60c.	8.25c.
Common wire nails —base per keg less carload	$3.20	$3.20	$3.20

All items subject to differentials for quantity.

TOOL STEEL

Prices are same for warehouse distribution at all points on or East of Mississippi River. West of Mississippi quotations are 1c. a lb. higher.

	Base per Lb.
High speed	57c.
High carbon chrome	37c.
Oil hardening	22c.
Extra	17c.
Regular	14c.

Demand for Lead Improves Markedly After Month of Light Sales

Copper Buying Expanding Gradually—Zinc Prices Strengthen Abroad —Tin Quiet With London Market Closed

NEW YORK, Jan. 28. — Demand for copper in the domestic market appears to be gradually expanding, although the volume of new business as yet is not heavy. Sales yesterday of 1527 tons brought the month's total to date to 27,142 tons. Company owned fabricators were responsible for most of the tonnage moved. Export sales in recent weeks have tended upward. The domestic price for copper continues at the 9.25c. a lb. level. There was no market in London today for the metal.

Lead

Demand for lead continues active today following heavy sales last week. Producers state that consumer inventories, which increased considerably in the fourth quarter, have finally been reduced to a state where replacements are necessary. The slump in January business occasioned by an active fourth quarter naturally left the consuming end of the trade with more stock on its hands than could readily be used up on the basis of a decelerated industrial situation. Last week's sales were double the volume of sales in the preceding period, and were mainly for January positions. The leading producer yesterday opened books for March, though the rest of the trade somewhat anticipated this date. Pressure upon dealers to sell into March has been considerable. Whereas business last week was a bit better in certain directions than in others, all sellers easily disposed of their intakes. The leading producer accumulated a waiting list. Severe weather has bettered inquiry from battery makers, and pigment interests are now purchasing against spring paint requirements. Cable makers are reported more active. The price for lead remains firm at the 4.50c. a lb. level. Ore is unchanged at $47 a ton.

Tin

The market for tin was inactive throughout most of last week, but commencing Jan. 25 importers experienced a moderate pick-up in demand for nearby positions. Spot, January and February were preferred. Since the London markets are closed today, there are no prices. The domestic price for spot Straits tin is nominally given as 46.30c. a lb. An interesting piece of information is that Bolivian tin production should shortly increase to quota standards because Paraguay last week released thousands of Bolivian prisoners captured during the conflict. Freedom for these prisoners means that the country's tin mines will be better manned. So far arrivals of tin to the United States in January total 5935 tons. Pending arrivals aggregate 5310 tons.

Zinc

Inquiry for zinc was reported quiet today, although the undertone of the market has improved due to the rise in quotations abroad. The price there has worked upward approximately 16 points in the last four days, and pressure from that source on domestic conditions has accordingly been reduced. Satisfaction is also seen in the statistical position of zinc, which is stronger than that of any other non-ferrous metal. Last week's sales came to about 3000 tons, a slight improvement over earlier weeks but not sufficient to encourage sellers materially. Apparently manufacturers' needs must strengthen before a buying movement can get underway. If this happens and the foreign market continues to improve, an advance in domestic quotations can be expected. At present the price is firm at 4.85c. a lb.

The Week's Prices. Cents Per Pound for Early Delivery

	Jan. 22	Jan. 23	Jan. 24	Jan. 25	Jan. 27	Jan. 28
Electrolytic copper, Conn.*	9.25	9.25	9.25	9.25	9.25	9.25
Lake copper, N. Y.	9.37½	9.37½	9.37½	9.37½	9.37½	9.37½
Straits tin, Spot, New York	46.00	46.12½	46.40	....	46.25	46.30
Zinc, East St. Louis	4.85	4.85	4.85	4.85	4.85	4.85
Zinc, New York†	5.22½	5.22½	5.22½	5.22½	5.22½	5.22½
Lead, St. Louis	4.35	4.35	4.35	4.35	4.35	4.35
Lead, New York	4.50	4.50	4.50	4.50	4.50	4.50

*Delivered Connecticut Valley; price ¼c. lower delivered in New York.
†Includes emergency freight charge.

Aluminum, virgin 99 per cent plus, 19.00c.-22.00c. a lb., delivered.
Aluminum, No. 12 remelt, No. 2 standard, in carloads, 17.00c. lb., delivered.
Nickel, electrolytic, 35c. to 36c. a lb. base refinery, in lots of 2 tons or more.
Antimony, Asiatic, 12.62½c. a lb., New York.
Quicksilver, $77.50 to $78.00 per flask.
Brass ingots, commercial 85-5-5-5, 9.50c. a lb., delivered; in Middle West ¼c. a lb. is added on orders for less than 40,000 lb.

From New York Warehouse

Delivered Prices, Base per Lb.

Tin, Straits pig	47.25c. to 48.25c.
Tin, bar	49.25c. to 50.25c.
Copper, Lake	10.25c. to 11.25c.
Copper, electrolytic	10.25c. to 11.25c.
Copper, castings	10.00c. to 11.00c.
*Copper sheets, hot-rolled	16.50c.
*High brass sheets	14.62½c.
*Seamless brass tubes	16.87½c.
*Seamless copper tubes	17.00c.
*Brass rods	13.12½c.
Zinc, slabs	5.75c. to 6.75c.
Zinc, sheets (No. 9), casks, 1200 lb. and over	10.25c.
Lead, American pig	5.00c. to 6.00c.
Lead, bar	6.00c. to 7.00c.
Lead, sheets, cut	8.25c.
Antimony, Asiatic	14.00c. to 15.00c.
Alum., virgin, 99 per cent, plus	23.30c.
Alum., No. 1 for remelting, 98 to 99 per cent	18.50c. to 20.00c.
Solder, ½ and ½	29.50c. to 30.50c.
Babbitt metal, commercial grades	25.00c. to 60.00c.

*These prices are also for delivery from Chicago and Cleveland warehouses.

From Cleveland Warehouse

Delivered Prices per Lb.

Tin, Straits pig	51.25c.
Tin, bar	53.25c.
Copper, Lake	10.25c.
Copper, electrolytic	10.25c.
Copper, castings	10.00c.
Zinc, slabs	6.25c. to 6.50c.
Lead, American pig	5.20c. to 6.50c.
Lead, bar	8.50c.
Antimony, Asiatic	17.00c.
Babbitt metal, medium grade	19.25c.
Babbitt metal, high grade	55.25c.
Solder, ½ and ½	29.50c.

Old Metals, Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators, and selling prices are those charged to consumers after the metal has been prepared for their uses. (All prices are nominal.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	7.12½c.	7.87½c.
Copper, hvy. and wire	7.00c.	7.50c.
Copper, light and bottoms	6.00c.	6.50c.
Brass, heavy	4.00c.	4.62½c.
Brass, light	3.25c.	4.00c.
Hvy. machine composition	6.00c.	6.50c.
No. 1 yel. brass turnings	5.12½c.	5.62½c.
No. 1 red brass or compos. turnings	5.62½c.	6.12½c.
Lead, heavy	3.50c.	3.87½c.
Zinc	2.50c.	2.87½c.
Cast aluminum	12.12½c.	13.25c.
Sheet aluminum	13.25c.	14.75c.

Output Holds at 66 Per Cent at Cleveland

Orders From Motor Car Industry Show Slight Pick-up—Household Equipment Makers Order Freely—Erie to Buy Cars

CLEVELAND, Jan. 28.—Orders for sheets from the motor car industry picked up slightly the past week, but these were for small lots and evidently do not indicate any early increase in automobile production. Some new releases also came from Ohio stamping plants making automobile parts which recently slowed down because of temporary holding up of shipments by automobile manufacturers. Demand for steel from the automotive industry is expected to be rather light in February but to come back in good volume in March.

Ingot output in the Cleveland-Lorain district is unchanged this week at 66 per cent of capacity. The operation of the local continuous strip mill has been reduced to 80 per cent. While sheet and cold strip mills are still operating at near capacity the manufacture of narrow hot strip has been curtailed sharply. Backlogs of sheet and strip steel are being rapidly reduced. Some mills are accumulating sheet stocks subject to release by automotive consumers.

Demand for finished steel outside of the motor car industry continues fairly good. Manufacturers of household equipment are ordering sheets quite freely and also are placing considerable business in bars and angles. The Erie railroad will purchase 500 box cars and 300 automobile cars, inquiry for which will be out shortly. In wire products a fair demand has developed for fence but restricted production of automobiles has resulted in a slowing down in orders for manufacturers' wire. Some billets are being sold at the new price but not in large enough lots to test the advance.

Pig Iron

Sales in lots up to 100 tons are holding to recent volume. Shipments show little change. For January they will aggregate about 55 per cent of the amount shipped in December. Shipping orders from motor car foundries have slowed down, but they are expected to pick up about March 1. Makers of heating and plumbing equipment have increased operations to build up stocks and look for a good volume of business this year in view of the expected increase in residence construction and the demand for equipment for Federal housing projects.

Sheets

New demand from motor car manufacturers has gained moderately, following two weeks of inactivity. Several orders from this source were placed during the week but none for large lots. Releases for parts are coming out a little more freely to parts makers and this is reflected in some gain in specifications from stamping plants. Some mills have accumulated stocks of full-finished sheets which they are holding for release from the automobile companies. Demand from stove manufacturers continues good, and orders have improved from washing machine manufacturers. Demand from refrigerator manufacturers is still rather light. Prices aside from the $3 a ton concession to automobile manufacturers and parts makers are firm. Producers are now considering the price situation and probably will make efforts to eliminate the concession to the automotive industry when prices are established for the second quarter.

Strip Steel

Demand is light. Some shipments are being held up because of the slowing down of the motor car industry. While little new business is coming from that source some mills still have a fair backlog. Non-integrated cold strip mills continue to order hot strip but not in as large lots as recently.

Bars, Plates and Shapes

While miscellaneous demand for bars is good, orders from forge shops and other makers of automobile parts has declined materially. Orders are well maintained from the agricultural implement industry, and there is fair demand from makers of oil country goods. Cold-finished bars are quiet. Structural inquiry continues rather light. New projects include a telephone exchange building in Cleveland requiring 300 tons. The Fisher Body Corpn. has awarded 4237 tons for its Grand Rapids stamping plant. More inquiries are coming out for small lots of reinforcing bars for WPA work,

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and the demand is expected to take an upward turn when spring approaches.

Scrap

With the movement of scrap restricted by the intensely cold weather, the scarcity of supply has become more pronounced and dealers are not disposed to sell, because they believe that by holding their scrap they will get better prices. Blast furnace scrap has advanced 25c. a ton. Other grades are very firm. The only consumer activity is the purchase of No. 1 heavy melting steel by a Youngstown consumer at a reported price of $14.75 or higher. For Cleveland delivery $13.50 has become the more common price that brokers are paying for No. 1 steel. For Youngstown delivery brokers are paying $14.25 to $14.50 for this grade and $13.50 to $13.75 for No. 2. Cast scrap is active and higher, and the supply is limited. Low phosphorus punchings are in good demand locally and are bringing $14.25 to $14.75. Some of the Michigan automobile companies have issued their February scrap lists. Chrysler is offering 4000 tons and Buick 2500 tons.

Reinforcing Steel

Awards 27,460 Tons—New Projects 1175 Tons

AWARDS

Westfield, Mass., 131 tons, State hospital unit, to Truscon Steel Co.

Pittsburgh, 500 tons, Babcock Boulevard in North Park, to Electric Welding Co.

McKeesport, Pa., 200 tons, Jerome Street improvement, to Electric Welding Co.

Washington, 2500 tons, general housing project proposal No. 518 at Branchville, Md.; placed by Procurement Division of Treasury Department with Joseph T. Ryerson & Son, Inc.

Philadelphia, 825 tons, two school buildings, to American Steel Engineering Co.

Philadelphia, 400 tons, school building, to Concrete Steel Co.

Philadelphia, 1100 tons of rerolled bars, four schools, to Sweets Steel Co.

Reading, Pa., 120 tons, school building, to Kalman Steel Corpn.

Grand Rapids, Mich., 2000 tons bars, press and die shop for Fisher Body division, General Motors Corpn., to Jones & Laughlin Steel Corpn.

Chicago, 100 tons, three schools, to an unnamed bidder.

Chicago, 640 tons, intercepting sewer No. 5, to Concrete Steel Co.

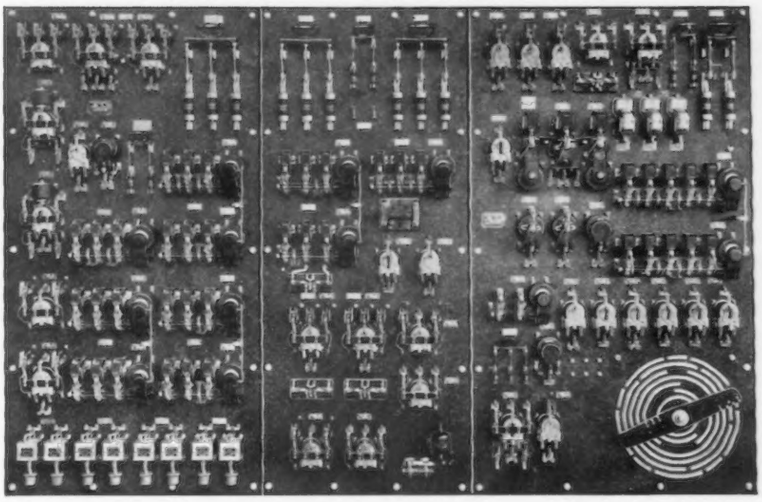
Fort Peck, Mont., 4500 tons, dam project awarded by United States Engineer Office, Kansas City, to Youngstown Sheet & Tube Co.

Grand Junction, Colo., 198 tons, State overhead crossing, to an unnamed bidder.

Los Angeles, 7850 tons, material for Colorado River aqueduct under Schedules No. 6p and 7p of specification No. 134, reported to have been awarded to Bethlehem Steel Co.

Clark-Sundh

THE A. C.—D. C. SYSTEM



This picture illustrates the flexibility of Clark Contactor design. We have here incorporated Magnetic Contactors for the control of A.C. Motors but the Contactors are operated by direct current magnets. This unique feature permits us to obtain exceedingly rapid reversals such as were required in this application.

We will be glad to furnish explanatory details of the advantages of this design which is particularly successful in Sheet and Tin Plate Mills in conjunction with Automatic Roller and Catcher Tables, Screwdowns and Reheating Furnaces with their respective conveyors.

THE CLARK CONTROLLER CO.
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CLEVELAND, OHIO

Los Angeles, 5500 tons, material for Colorado River aqueduct under schedule No. 8P of specification No. 115, United Concrete Pipe Corpn. has placed tonnage with an unnamed bidder.

San Francisco, 231 tons, two bulkhead piers, to Soule Steel Co.

San Francisco, 192 tons, exposition building, to W. C. Hauck & Co.; previously reported to Soule Steel Co.

Oakland, Cal., 280 tons, wharf extension, to Soule Steel Co.

San Francisco, 249 tons, Agassiz school, to Gunn, Carle Co.

Stockton, Cal., 133 tons, warehouses, to Kyle & Co.

NEW REINFORCING BAR PROJECTS

Augusta, Me., 100 tons, State hospital dormitory.

State of Missouri, 300 to 400 tons, highway projects; bids Jan. 31.

State of Wyoming, 220 tons, bridges in four counties; bids Feb. 4.

Santa Barbara, Cal., 100 tons, Sheffield dam extension; bids Feb. 10.

Santa Barbara, 300 tons, city filtration plant; bids Feb. 10.

Estacada, Wash., 105 tons, State bridge over Clackamas River; bids Feb. 6.

Finished Steel Prices Weaken Slightly at Philadelphia

Local Concern Fabricating Large Armor Plate Order—Scrap Trend Continues Very Strong

PHILADELPHIA, Jan. 28. — Fluctuations of sentiment in the steel industry usually follow a definite pattern. First, comes pressure for advancing quotations, and, then, a period wherein rumors of secret price cutting, reciprocal trading or disguised rebates are rampant. Currently, the trade in this area now seems to be well advanced into the second phase.

Structural steel fabricators report considerable shading of prices on important tonnages; reinforcing steel, in many instances, has been awarded to concerns bidding considerably below published prices; resale prices on pipe are disorganized as usual; plate quotations have been lowered in more than one case, and a recent sale of 250 tons of hot-rolled sheets was made considerably under quoted levels.

Cold-rolled steel, however, is holding moderately firm, and it is judged that not more than 25 per cent of the tonnage moving into this area is being taken at levels below those which are published. Pig iron, likewise, has disclosed no weakness, even though domestic sellers are being severely undercut by foreign brands.

These weaknesses in prices are believed to be temporary in character by most members of the trade and it is expected that, towards the end of the quarter, there will be a reaction against price cutting and talk of advancing quotations for second quarter delivery.

All district mills report that orders are flowing in at a rate about equal to the average December volume. No important change has been made in operations, and the district rate is unchanged at approximately 40 per cent of potential capacity.

Henry Disston & Sons, Inc., has received orders aggregating over $1,000,000 for light bullet-proof plates for armored trucks. Some of this steel has been rolled and delivered, but a considerable portion is yet to be rolled. Additional rolling equipment has been purchased to handle this order.

Pig Iron

Even though local foundries and mills are operating on comparatively satisfactory schedules, there has been no significant buying of iron. For the most part sufficient tonnages were stocked up at the old fourth quarter price to carry users well into the new year. Consequently no new business, other than a few miscellaneous carlots, is expected to appear before the end of February. Those few users in this district, particularly one steel mill and one pipe maker, who did not stock up last quarter are currently relying on lower priced foreign iron to fill their needs. A considerable volume of Russian and Dutch iron has come to these users at a considerable price reduction. Indian iron, however, is being held very close to domestic price levels.

Sheets and Strip

Backlogs of large mills are not as large as they were several weeks ago. Galvanized can be delivered in two weeks, hot-rolled sheets in about three weeks and cold-rolled grades in less than five weeks. The most conspicuous feature of the past week was the disposal of 250 tons of 24 gage license plate stock to the Pennsylvania Highway Department by Wheeling Corrugating Co. at a price considerably under competitors' bids. There has been no slackening in demand for cold-rolled sheets or strip, and prices, for the most part, are stable.

Bars, Plates and Shapes

The 2500 tons of reinforcing bars required for the Federal housing project at Branchville, Md., was awarded to Joseph T. Ryerson & Sons, Inc., on a draw. About nine sellers bid on this project. All prices were identical but considerably under published price levels. McCloskey & Co. have let 1100 tons of rerolled bars to Sweet's Steel Co. for four Philadelphia schools. American Steel Engineering Co., Concrete Steel Co. and Taylor-Davis, Inc., all shared in awards of billet bars totaling 1450 tons for other Philadelphia schools. No new structural steel business of any moment is up for bidding. Notable awards of the week were 510 tons for navy yard buildings, to Belmont Iron Works; 350 tons for a terminal building, to Bethlehem Steel Co., and 300 tons for a Pennsylvania bridge to Bethlehem Steel Co.

The Navy Department has awarded 2956 tons of plates for stock at the various yards as follows: Central Iron & Steel Co., 2318; Lukens Steel Co., 203; Alan Wood Steel Co., 315; Worth Steel Co., 15; Joseph P. Cattie & Brothers, 60; Enterprise Galvanizing Co., 20; Penn Galvanizing Co., 25.

Imports

The following iron and steel imports were received here last week: 140 tons of pig iron from Soviet Russia; 122 tons of structural shapes from Belgium; 135 tons of sponge iron, 116 tons of steel tubes, 23 tons of steel forgings, 48 tons of steel wire, 6 tons of steel billets and 30 tons of steel bars from Sweden, and 5 tons of structural shapes from Germany.

Scrap

Little scrap has moved from yards to consumers during the last week because of inclement weather. Inasmuch as melters' inventories are not large, pressure for deliveries is becoming more pronounced. Although only a small tonnage of No. 1 heavy melting steel has been sold in this immediate district at $13, brokers are freely paying $12.50 to cover old orders and are bidding as high as $12.75 on desirable lots. Cast iron is as strong as the steel grades, while heavy breakable is extremely scarce and not available under $12.50. Union Shipbuilding Co., Baltimore, has released 5000 tons of its large stock to a nearby consumer. A Baltimore broker is now loading No. 1 for England and expects to ship another cargo to the same country early in March. Both of these lots brought an f.o.b. price of around $12.50. A cargo left Philadelphia last week and another boat is expected in during the next two weeks.

The Boston office of the Bethlehem Steel Corpn. has been moved from 75 Federal Street to the corporation's Atlantic works, 80 Border Street, East Boston.

Fabricated Structural Steel

Awards in Good Volume—New Projects Light

NORTH ATLANTIC STATES

Providence, R. I., 1000 tons, Mount Pleasant school, to Bethlehem Fabricators, Inc.

Gardner, Mass., 400 tons, Florence Stove Co. warehouse, to Bethlehem Steel Co.

Hampton Village, N. H., 140 tons, State bridge, to Boston Bridge Works, Inc.

Dorset, Vt., 177 tons, State bridge, to Boston Bridge Works, Inc.

Waltham, Mass., 130 tons, employees' dormitory, to Groisser & Schlager Iron Works.

Worcester, Mass., 100 tons, Girls' Trade School, to Eastern Bridge & Structural Co.

Brentwood, N. Y., 255 tons, assembly hall, Pilgrim State Hospital, to Weatherly Steel Co.

New York, 12,300 tons, West Side Elevated Highway, Forty-sixth to Fifty-ninth Streets, to Harris Structural Steel Co.

New York, 205 tons, lower West Side health center, to Harris Structural Steel Co.

Wyoming, Pa., 235 tons, high school, to Wilkes-Barre Iron & Wire Co.

Brooklyn, 280 tons, Krug Baking Co. plant, to Schaefer Iron Works.

Philadelphia, 510 tons, navy yard building, to Belmont Iron Works.

Philadelphia, 350 tons, terminal building, to Bethlehem Steel Co.

Norristown, Pa., 295 tons, bridge, to Bethlehem Steel Co.

State of New Jersey, 115 tons, bridge, to Bethlehem Steel Co.

Lewisburg, Pa., 415 tons, State highway bridge, to Belmont Iron Works.

Angola, N. Y., 140 tons, highway bridge, to Lackawanna Steel Construction Corpn.

SOUTH AND SOUTHWEST

Alamance, N. C., 190 tons, State highway project, to Virginia Bridge & Iron Co.

Mason County, Tex., 280 tons, bridge, to Pittsburgh-Des Moines Steel Co.

Oklahoma City, Okla., 2000 tons, municipal auditorium, to Mississippi Valley Structural Steel Co.: previously reported to J. B. Klein Iron & Foundry Co.

Osage County, Okla., 160 tons, highway bridge, to J. B. Klein Iron & Foundry Co.

CENTRAL STATES

Cleveland, 100 tons, Noble Road theater, to Bethlehem Steel Co.

Grand Rapids, Mich., 4300 tons, die and press shop for Fisher Body division, General Motors Corpn., to Jones & Laughlin Steel Corpn.

East Palestine, Ohio, 115 tons, high school, to Ohio Structural Steel Co.

Indiana Harbor, Ind., 610 tons, mold yard runway, to Duffin Iron Co.

Hammond, Ind., 800 tons, two schools, to Duffin Iron Co.

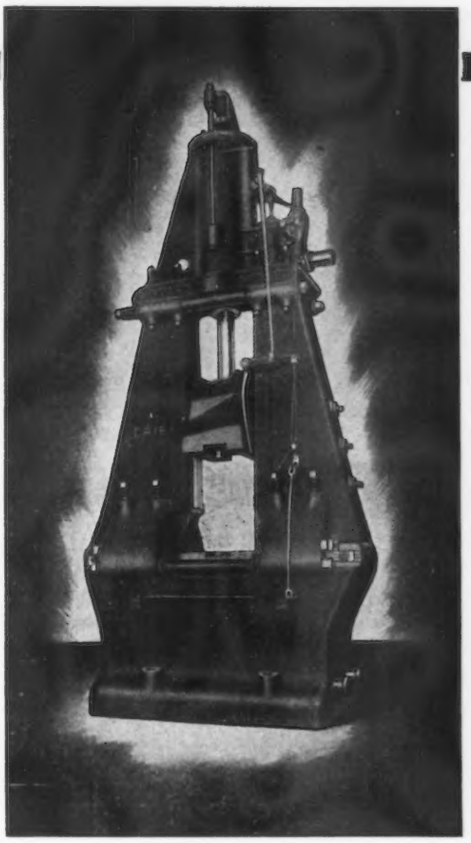
Jefferson, Wis., 525 tons, bridge, to Milwaukee Bridge Co.

Ferguson, Mo., 280 tons, State highway bridge, to Stupp Brothers Bridge & Iron Co.

Carroll, Iowa, 295 tons, State highway bridges, to Bethlehem Steel Co.

Ellis County, Kan., 140 tons, highway bridge, to Kansas City Structural Steel Co.

Very Good—or Very Best?



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WESTERN STATES

Fort Collins, Colo., 250 tons, city power house, to an unnamed bidder.

Glasgow, Mont., 100 tons, State undercrossing, to an unnamed bidder.

Butte, Mont., 192 tons, State bridge and viaduct, to an unnamed bidder.

Flathead County, Mont., 100 tons, State undercrossing, to an unnamed bidder.

Wilmington, Cal., 650 tons, viaduct, to Bethlehem Steel Co.

Hobart, Cal., 366 tons, State undercrossing, to Bethlehem Steel Co.

Verdemont, Cal., 100 tons, State undercrossing, to Consolidated Steel Corpn.

Famosa, Cal., 287 tons, State bridge over Pico Creek, to Virginia Bridge & Iron Co.

Buena Park, Cal., 150 tons, State undercrossing, to Consolidated Steel Corpn.

Los Angeles, 230 tons, State undercrossing at Firestone Boulevard, to Virginia Bridge & Iron Co.

Los Angeles, 795 tons, State overhead crossing at Figueroa Street, to Consolidated Steel Corpn.

Los Angeles, 900 tons, tunnel supports for Metropolitan Water District, Specification No. 133, to Consolidated Steel Corpn.

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Long Beach, Cal., 120 tons, supports for city tanks, to an unnamed bidder.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

Westerly-North Kingston, R. I., 135 tons, two bridges.

Springfield, Mass., 100 tons, Armory Street bridge.

Brooklyn, 2000 tons, public school No. 239.

Philadelphia, 500 tons, Navy Department hangars and catapult.

Kenmore, N. Y., 100 tons, hall for village of Kenmore and town of Tonawanda.

CENTRAL STATES

Cleveland, 300 tons, Cedar Exchange for Ohio Bell Telephone Co.; bids Feb. 11.

Cleveland, 200 tons, foot bridge for Great Lakes exposition.

State of Michigan, 230 tons, highway bridges.

Galesburg, Ill., 125 tons, post office.

State of Illinois, 3700 tons, highway bridges: Perry County, 188 tons, and Macoupin County, 120 tons, Worden-Allen Co. low bidder; Hannibal County, 425 tons, Clinton Bridge Co. low bidder; Macupin County, 235 tons, R. C. Mahon Co. low bidder; Logan and Tazewell counties, 260 tons, and Peoria County, 100 tons, Vincennes Bridge Co. low bidder; East St. Louis, 500 tons, and LaSalle County, 100 tons, Midland Structural Steel Co. low bidder; Wabash County, 125 tons, Mississippi Valley Structural Steel Co. low bidder; and Fulton County, 1250 tons, Duffin Iron Co. low bidder.

State of Indiana, 500 tons, bridges.

State of Missouri, 550 tons, highway bridges, including Pettis County, 150 tons, and Vernon County, 140 tons; bids Jan. 31.

Kansas City, Mo., 6000 tons, city hall; bids Jan. 30.

Seward County, Kan., 365 tons, Cimarron River State bridge.

WESTERN STATES

Salida, Colo., 165 tons, State highway bridge.

Pueblo, Colo., 275 tons, underpass.

Blackfoot, Idaho, 450 tons, Snake River State bridge.

Big Horn County, Wyo., 109 tons, State bridges on Basin-Burlington road; bids Feb. 4.

Fremont County, Wyo., 448 tons, State bridge on Dubois-Riverton road; bids Feb. 4.

Ventura, Cal., 500 tons, County bridge over Santa Clara River; bids Feb. 7.

Portland, Ore., 185 tons, State overhead crossing on Columbia River highway; bids Feb. 7.

FABRICATED PLATES

AWARDS

Carlisle Barracks, Pa., 110 tons, 200,000 gal. elevated tank for United States Quartermaster Corps, to Tippett & Wood.

Lawrenceburg, Ind., 365 tons, Joseph E. Seagrams & Sons, 24 fermenters, to Stacey Mfg. Co.

Toronto, Ont., 400 tons, barges for International Petroleum Co., to Marietta Mfg. Co.

NEW PROJECTS

Alhambra, Cal., 160 tons, two city tanks; bids opened Jan. 28.

SHEET PILING

NEW PROJECTS

San Diego, Cal., 1300 tons, H-piling foundation for Civic Center; bids opened Jan. 29 by Treasury Department at San Francisco.

California Water Job To Take 96,600 Tons

WHEN discussing construction plans that will involve the purchase of 96,600 tons of steel during 1936 F. E. Weymouth, general manager and chief engineer of the Metropolitan Water District of Southern California, states: "New work to be undertaken by the district during the current year will consist principally of construction of the three remaining aqueduct pumping plants not now under contract, construction of approximately 25 miles of additional pipe lines in the distribution system, and construction of three intermediate reservoirs on the main aqueduct between Parker Dam and the terminal reservoir."

All reinforcement steel to be purchased directly by the district for the remainder of construction is covered by existing contracts under Specification No. 109. Of the steel remaining to be purchased under these contracts at the end of 1935 it is estimated that 14,500 tons of rail steel reinforcement and 19,000 tons of billet steel reinforcement will be bought during 1936.

Another large purchase this year will be the tower steel for the 237-mile transmission line between Boulder Dam power house and the five aqueduct pumping plants. The estimated total of this contract is 5600 tons of structural steel, all of which is expected to be on the job before the end of the year.

On distribution system pipe lines between Cajalco reservoir and Pasadena there will be used approximately 15,000 tons of bar reinforcement and 7000 tons of cylinder reinforcement in precast concrete pipe construction during 1936, and an additional 31,000 tons of plate steel will be required in the fabrication of steel pipe.

Classifying 1936 steel requirements into three categories Mr. Weymouth summarized them as follows:

	Tons
Reinforcement bars—rail steel	14,500
Reinforcement bars—billet steel	34,000
Structural shapes	15,100
Plate steel	33,000
Total	96,600

In commenting further on the progress of the work Mr. Weymouth pointed out that 60,000 tons of steel has been purchased by the district to the end of 1935.

Severe Weather Hampers Business at New York

Upturn in Tin Plate Orders, However, Is Source of Encouragement—Weakness in Wire Nails Is Accentuated

NEW YORK, Jan. 28.—Sustained severe weather has had a generally depressing effect on new business and has also impeded shipments of reinforcing bars, structural steel and, to some extent, pipe. Total steel bookings in this district for the current month will fall materially below those of December. Tin plate orders, however, have picked up, encouraging the hope that from now on can company specifications will be on the ascending scale. Railroad buying is also definitely expanding. The Lehigh Valley will build 250 new composite open-top cars and 250 new all-steel gondola cars and will rebuild 500 open-top cars in its own shops.

Contracts Nos. 60 and 61, the last major contracts to be placed for the Triborough bridge, New York, will come up for bids Feb. 12. About 3000 tons of reinforcing bars and structural steel for the bridge roadway is involved.

Importations of wire nails have unsettled domestic prices, which in some instances have been cut as much as 20c. a keg. Continued weakness of sheet prices in the Detroit district has proved a disturbing influence here. Makers of steel drums and barrels, whose own prices have become demoralized, are now pressing for concessions on their raw material sheets. Deliveries on cold-rolled sheets still range from four to five weeks, but on other grades of sheets delivery is no longer a problem.

Pig Iron

This market continues quiet, though week-to-week sales indicate a fairly constant rate of demand. As previously reported, the rate of melt among jobbing foundries in Brooklyn is gradually expanding, but the business is spotty. To a certain extent, inclement weather has affected foundry operations. Shipments to the trade as a whole are declining. Bookings last week totaled 2450 tons, as against 2200 tons sold in the week before. Part of last week's commitments were for delivery outside this district.

Scrap

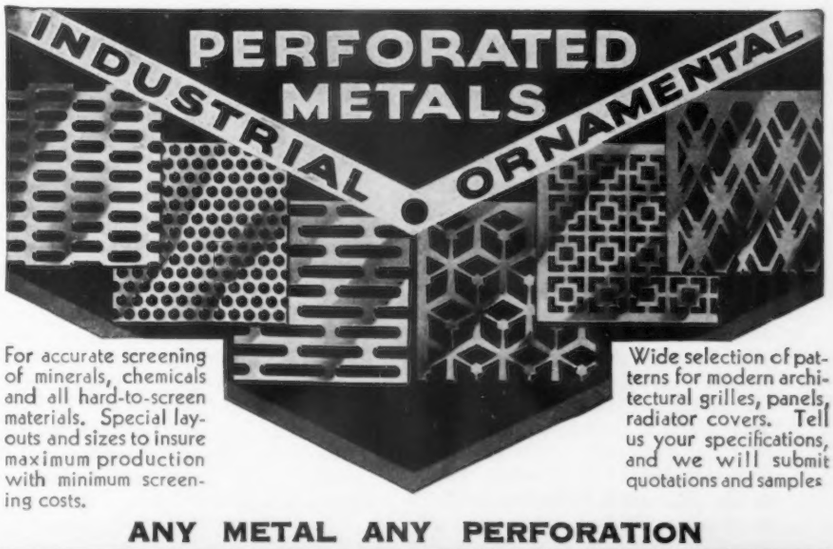
The turnover of material in this area is still severely hampered by inclement weather, and with experts prophesying additional snow, no broker is inclined to take a short position. In fact, leading exporters are having difficulty in securing enough scrap to take care of scheduled boat loadings, but in this connection they have been helped by the fact that boats are arriving one to two weeks late. England continues to take delivery on larger quantities of steel grades, and additional orders are being received as old contracts are liquidated. Japan likewise is showing more interest in renewing its buying in large volume and Italy is constantly in the market for additional supplies. This latter country, however, is finding brokers willing to do business on a large scale. The strong position of the eastern Pennsylvania domestic market has been a favorable influence here. Carloads of No. 1, No. 2 and cast grades are leaving nearby New Jersey points for this area in as heavy a volume as current weather conditions permit.

Reinforcing Steel

The reinforcing steel market is still in an unsettled condition due to several unannounced awards on fairly large projects. About 2500 tons is awaiting disposition at Branchville, Md., where 11 identical bids of $6 less than the quoted price to consumers were submitted on a PWA resettlement project. An additional Bronx sewer job of 1000 tons has been awarded to Rodgers & Haggerty, contractors, subject to PWA approval. No announcement has yet been made regarding the controversy over the contracts for the Queens approach to the Triborough Bridge. The amount of steel to be used in the East River tunnel has not been determined.

Advances in Scrap At St. Louis

ST. LOUIS, Jan. 28.—It is expected that it will be several weeks before the Missouri Pacific System will issue inquiries for the



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materials it has been authorized to purchase by the Federal Court here. As told last week, the court authorized the expenditure during 1936 of $6,442,894, including $4,442,894 for roadbed betterments and improvements, and $1,599,894 for improvements to equipment. Nearly $2,000,000 is provided for rails and track materials and $493,320 for new freight cars. The extent of the inquiries to be issued shortly is said to be indefinite at this time.

The Wabash Railway has been authorized by the court to spend $476,694 for repairing 1310 freight cars and $13,855 for construction of an automatic coaling station at Pattonsburg, Mo.

The Missouri Highway Commission will open bids Friday for highway projects requiring 550 tons of structural steel and 300 to 400 tons of reinforcing bars. It will be the first letting in several months. The Illinois Highway Commission opened bids for highway bridges requiring 3700 tons of structural steel. Operations of the structural fabricating plants in the St. Louis industrial district have been stepped up to an average of 50 per cent of capacity, two of the seven plants operating at 75 per cent of capacity.

The St. Louis Public Service Board has asked for bids on Feb. 21 for pressure conduit No. 2 from Howard Bend to Stacy Park, requiring approximately 17,357 ft. of 60-in., 9-16 in. thick, and 29,400 ft. of 60-in., ½-in. thick, welded steel pipe, together with all couplings required. The estimated cost is $620,000.

The scrap market is higher, because dealers are eager to cover on existing sales, and the advances are having the desired effect of bringing out more material. However, the mills in the district are doing no new buying. No. 2 heavy melting steel is 25c. a ton higher; heavy turnings, No. 1 railroad wrought, steel rails less than 3 ft. and cast iron carwheels are 50c., and cast iron borings and shoveling turnings are $1 up.

Shipments and sales of pig iron continue light, melters having provided themselves with sufficient tonnages during the last quarter of 1935 for present requirements. In fact, it is not expected that there will be any buying of consequence until the latter part of the first quarter of 1936. Stove foundries are expecting a big trade, and the implement manufacturers are planning no let-up in their present heavy production.

Operations Rising In South

BIRMINGHAM, Jan. 28.—The Ensley rail mill, which was closed Jan. 1, will resume production Feb. 3, for a run of several months. Last week, the Southern Pacific announced that it had ordered 17,000 tons of rails from the Tennessee Coal, Iron & Railroad Co. During this month, the St. Louis-San Francisco, the Illinois Central and the Southern have also placed orders, as previously reported.

Three Ensley open-hearth furnaces will be fired on Jan. 30, and by the end of the week the district's total will be 15. At Fairfield, eight are in operation this week and at Alabama City, four. Last week, operations ranged from 11 to 12.

Another Ensley blast furnace, No. 1, will be blown in this week. This will be the fourth active stack at Ensley. On Saturday Woodward Iron Co. banked its No. 3 stack, but still has two in operation. The district's total will remain at 12, the additional Ensley furnace offsetting the reduction at Woodward.

Steel buying continues at a fair rate, with new tonnage distributed among all products. Pig iron demand is light, but shipments are gradually improving.

Southern Ohio Rate Holds at 78 Per Cent

CINCINNATI, Jan. 28.—Sheet steel buying in January is running about 20 per cent below the December volume. This is due in part to inventories and a tendency of automobile makers to curtail specifications until retail car sales disclose the trend of consumer demand. Sheet bookings, the past week, averaged about 85 per cent, a trifle better than the month's established level, and mill operators look for further improvement during February. Production rates are on a parity with demand, the leading district interest reporting all units in operation at less than capacity rates.

Steel ingot production is unchanged from last week at 78 per cent. Only one interest is operating all open-hearths.

The pig iron market is quiet, but possessed of factors likely to produce heavier buying during the next 30 to 60 days. Many melters were carried over the turn of the year on old contracts, but specifications against these have been so brisk that these old commitments will be exhausted before the end of the quarter. In addition, foundry operations are tending slowly upward, the average now being a trifle above 60 per

cent. Jobbing shops are slow in getting started, but specialty melters indicate an expanding demand. One stove foundry, out for repairs a week ago, is back in production. Pig iron prices are firm and unchanged.

Foundry grades of coke are slowly improving in demand. Domestic sizes are active under the cold weather stimulus.

Movement of scrap to steel plants is fairly active, but new commitments are infrequent. A slight scarcity of the better grades of scrap tends to strengthen the market, but dealer's bids are unchanged.

The 100-in. semi-continuous sheared plate mill being built for the Carnegie-Illinois Steel Corpn., Homestead works, by the United Engineering & Foundry Co., will have Timken bearings on the back-up and work roll necks of five of the seven stands, two of the roughing stands being mounted on plain bearings. In addition to the roll-neck bearings, Timken has been given the order for the bearings on the screwdowns, gear drives, table drives and accessory equipment. The back-up roll-neck bearings represent a new size, 31 x 48 x 33 in., each weighing 8167 lb. Work roll-neck bearings will also be four-row Timken units, 24 x 14½ in., weighing 1030 lb., and those on the finishing end being 18 x 23½ x 11 in., weighing 445 lb.

Blast Furnace Plan and Prospects in the U.S.S.R.

(CONTINUED FROM PAGE 29)

and 60 per cent of all the iron ore charged into Soviet blast furnaces will be sintered. Plans are also being put into operation to increase the quantity of iron ore mined by advanced mechanical methods from 35 per cent in 1932 to 85 per cent in 1937. Likewise, it is also planned to increase the production capacity of all iron ore mines by Jan. 1, 1938, to 57,000,000 tons, as against 23,000,000 tons in 1932.

All of the information just given is based on data published in the Soviet press by the State Plan Commission of the Peoples Commissars Soviet in the U.S.S.R.

TABLE IV

Number and Location of Blast Furnaces to be Constructed and Put in Operation During the Second Five-Year Plan Period

Name of Blast Furnace Plant	Number of Blast Furnaces	Period of Construction	Location of Blast Furnace Plant	Notes
Magnitogorsk ...	6	1929 to 1937	Urals District	Complete plant will have eight furnaces
Kusnetzk 1st.....	2	1929 to 1935	West Siberia	Complete plant will have four furnaces
Kusnetzk 2nd....	1	1934 to 1937	West Siberia	
New Tagil.....	3	1930 to 1937	Urals District	
Bakalsk	2	1934 to 1937	Urals District	
Khalilov	2	1934 to 1937	South Urals	
Far East.....	1	1936 to 1937	Far East	
Petrovsk-Zabaykalsk ...	2	1935 to 1937	East Siberia	
Saporog-Steel ..	4	1930 to 1937	South Russia	
Krivoy-Rog	4	1931 to 1937	South Russia	
Asov-Steel	5	1931 to 1937	South Russia	
New-Tulsk	2	1931 to 1935	Central Russia	
New-Lipetsk	2	1931 to 1935	Central Russia	
Total	36			

TABLE V

Number of Blast Furnaces to be Constructed and Put in Operation During the Second Five-Year Plan Period at Existing Plants in South Russia

Name of Plant	Number of Blast Furnaces	Year of Completion of Construction	Location of Plant
Makeyevsk	2	1937	South Russia
Voroshilov	2	1937	South Russia
Rykov	..	....	South Russia
Stalin	1	1937	South Russia
DSMO	1	1937	South Russia
Kertsh	..	....	South Russia
Dzerzhinsk	2	1937	South Russia
Petrovsk	1	1936	South Russia
Total	9		

British Coal Strike Averted—Steel Prices Advanced on Strong Demand

LONDON, Jan. 27. (*By Cable*).—The British iron and steel markets are overshadowed by national grief.

The pig iron shortage continues. Makers are drawing upon depleted stocks and are unable to quote on early delivery. The threatened coal stoppage has been averted and the early relighting of several additional furnaces is probable.

Steel makers have large orders, and, with further important contracts pending, record output is anticipated.

A shortage of semi-finished steel has been alleviated by larger Continental shipments. There is marked improvement in demand for boiler and ship plates. Domestic demand for bars and black and galvanized sheets is reported. Structural steel makers were never busier.

Home demand for tin plate is active, but forward business is affected by a 5s. advance in the future price of tin plate bars. Permitted production has been raised from 55 to 60 per cent of allotted output. Talk of an early increase in tin plate prices owing to higher coal and steel prices is heard, but, in view of lower tin prices, this action is considered unjustifiable in some quarters.

Continental iron and steel markets show that the slight improvement has been maintained but the expected marked seasonal expansion is not yet evident. Russian orders are good. Large releases have been made to the United Kingdom and some prices have been advanced for that market.

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton

Ferromanganese, export	£9	
Billets, open-hearth	£5 10s.	to £5 15s.
Tin plate, per base box	18s. 9d.	to 19s. 3½d.
Steel bars, open-hearth	£7 17½s.	
Beams, open-hearth	£7 12½s.	
Channels, open-hearth	£7 17½s.	
Angles, open-hearth	£7 12½s.	
Black sheets, No. 24 gage	£9 15s.	
Galvanized sheets, No. 24 gage	£11 15s.	

Official Continental Prices, f.o.b. Continental Ports

Per Metric Ton, Gold £

Current dollar equivalent is ascertained by multiplying gold pound price by 124.14 to obtain franc equivalent and then converting at present rate of dollar-franc exchange.

Billets, Thomas	£2 7s.	
Wire rods, No. 5 B.W.G.	£4 10s.	
Steel bars, merchant	£3 5s.	
Sheet bars	£2 8s.	
Plate, ¼ in. and up	£4 2s.	6d.
Plate, 3/16 in. and 5 mm	£4 4s.	8d.
Sheets, ⅛ in.	£4 9s.	8d.
Beams, Thomas	£3 2s.	6d.
Angles (Basic)	£3 2s.	6d.
Hoops and strip base	£4 2s.	6d.
Wire, plain, No. 8	£5 7s.	6d.
Wire nails	£5 15s.	
Wire, barbed, 4 pt. No. 10 B.W.G.	£8 15s.	

Pipe Lines

Phillips Petroleum Co., Bartletsville, Okla., plans 10-in. welded steel pipe line in section of Missouri Street, Oklahoma City, for natural gas transmission. Cost over $50,000. A. H. Riney, Bartletsville, is company engineer.

Petroleum Transportation Co., Millbrook, Mich., has authorized installation of steel pipe lines in Millbrook-Hinton-Belvidere gas fields, Mecosta and Montcalm counties, Mich., for gathering system for connection with new steel pipe line of Consumers Power Co., Jackson, Mich., for natural gas transmission from this district to Lansing, Mich., and vicinity. Work on last noted steel pipe line is under way.

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 5 for galvanized and black steel pipe; also for black and galvanized pipe couplings, fittings, etc. (Circular 500).

Rodessa Oil & Refining Co., Rodessa, La., is completing surveys for 8-in. welded steel pipe line from Rodessa oil field district to oil refinery at Cedar Grove, about 40 miles, for crude oil transmission.

Continental Oil Co., Tulsa, Okla., has let contract to Apex Construction Co., Second National Bank Building, Houston, Tex., for welded steel pipe line from Tepetate oil field district, near Eunice, La., to new bulk storage and distributing plant on Calcasieu River, near Lake Charles, La., for oil transmission to latter point, about 45 miles.

Little Rock, Ark., plans early installation of about 231,000 ft. of 40-in. steel pipe (with alternate bids on concrete) from source of new main water supply on Alum Fork of Saline River, about 40 miles distant, to connection with city station. Cost close to $3,000,000. City has purchased local water distribution system from Arkansas Water Co. and will operate as municipal property. Burns & McDonnell Engineering Co., 107 West Linwood Boulevard, Kansas City, Mo., is consulting engineer.

Public Utilities Commission, City Hall, San Francisco, closes bids Feb. 5 for new water pipe line from Crystal Springs district to point near city, consisting of: Section A, 35,050 ft. of 60-in. welded steel pipe, ⅜-in. plate; and Section B, 20,540 ft. of 60-in. steel cylinder reinforced-concrete pipe, with certain short sections of line 60-in. welded steel pipe, ⅜-in. plate; also until Feb. 4, 36 and 44-in. steel pipe for different city streets. N. A. Eckart, 425 Mason Street, is consulting engineer.

Board of Public Service, St. Louis, will take bids until Feb. 21 for 17,357 ft. of 60-in. welded steel pipe, 9/16 in. thick, and 29,400 ft. of 60-in. ½-in. thick, for pressure conduit No. 2 from Howard Bend to Stacy Park.

Heppner, Ore., has awarded 100 tons of 8-in. steel pipe for water system improvements to an unnamed bidder.

Canyon City, Ore., will take bids Feb. 7 on 100 tons of 4-in. steel pipe.

Railroad Equipment

Pacific Fruit Express contemplates purchase of 3000 refrigerator cars.

Erie will issue inquiries shortly for 500 box cars and 300 automobile cars.

Chicago, Burlington & Quincy is constructing 500 box cars at Havelock, Neb., and 500 at Galesburg, Ill.

Wabash has placed orders for materials for rebuilding 300 hopper cars, requiring about 2000 tons.

Lehigh Valley will build and rebuild a total of 1000 open-top cars in its own shops. Of the 500 new cars to be built 250 will be composite cars and 250 will be all-steel gondola cars.

Wabash has been authorized by the court to spend $476,694 for the repair of 1310 freight cars. It has also been given authority to dismantle 394 freight cars and 16 locomotives at an estimated cost of $17,442, with salvage estimated at $46,667.

American Car & Foundry Motors Co. has received the following orders for a.c.f. motor coaches: Boston Elevated Railway, four; Eastern Massachusetts Street Railway, five; Transit Co. of Harrisburg, two; Des Moines Railway Co., two.

RAILS

Chicago & North Western has ordered 16,000 tons of 112-lb. rails from Inland Steel Co.

Long Beach, Cal., opened bids Jan. 29 on 603 tons of 128 and 149-lb. rails.

Los Angeles Municipal Terminal Railroad, Los Angeles, will take bids Feb. 19 on 471 net tons of 90 and 128-lb. rails.

Kansas, Oklahoma & Gulf has applied for PWA loan of $285,000 to purchase 5200 tons of 110-lb. rails and 500 tons of 90-lb. rails.

Missouri Pacific will purchase 17,000 tons of rails.

Gear Makers Plan Philadelphia Meeting

THE twentieth annual convention of the American Gear Manufacturers' Association will be held at the Adelphia Hotel, Philadelphia, Monday and Tuesday, April 20 and 21. Russell C. Ball, president, Philadelphia Gear Works, Inc., is chairman of the convention committee, and B. F. Waterman, engineer, Brown & Sharpe Mfg. Co., and honorary president of the association, is chairman of the program committee. A full program of technical and commercial discussion is being arranged.

A. A. Ross, engineer, General Electric Co., West Lynn, Mass., is president of the A. G. M. A., and J. C. McQuiston, Penn Lincoln Hotel, Wilkinsburg, Pa., is manager-secretary.

The Welding of Alloy Steels

(CONTINUED FROM PAGE 23)

con (Cromansil steel), chromium-silicon-phosphorus-copper (Cor-Ten steel), manganese-copper (Man-Ten steel), chromium-molybdenum or vanadium steel, manganese-vanadium or molybdenum steel, and copper-molybdenum steel. The choice of any one of these alloy steels will depend entirely on the service conditions. All of them possess high yield point and high tensile strength, even in the as-rolled condition without further heat treatment. The ratio of yield point to tensile strength is high by reason of the alloy additions. Some of them will possess added corrosion resistance since slight amounts of alloying elements, such a nickel, chromium, copper, or molybdenum, confers upon the steel a surprisingly large increase in resistance to certain corrosive media such as atmosphere, impure boiler feedwater or mine waters. For high temperature service such as plates for pressure vessels at elevated temperatures, certain of the low alloy steels possess improved creep resistance, i.e., resistance to plastic yielding of the steel under stress. For low temperature service such as pressure vessels and parts in the oil refining dewaxing process, in the manufacture of dry ice and in the liquefaction of gases, the improved impact resistance of certain of the alloy steels such as the 2 per cent nickel steels is utilized.

Modified Plain Carbon Steels

Mention should also be made of slight modifications in the usual plain carbon steel analysis, high yield strength and high tensile strength having been obtained by a slight increase in the usual contents of carbon, manganese, and silicon. In the as-rolled condition plain carbon structural steel possesses a variable yield point. A normalizing treatment results in increased and more uniform yield point. It has been possible by the use of the modified plain carbon steel analysis or by the use of a strengthening normalizing treatment to greatly extend the field of plain carbon steel into applications where some of the low alloy steels would otherwise have been used.

Possibly the most interesting example of the savings in weight accomplished by the use of a high yield strength steel of modified carbon steel analysis lies in the steel plates entering into the construction of the Boulder Dam penstocks. In these penstocks the design called for a ratio of yield strength to working stress of 2:1, which necessitated on the basis of 19,000 lb. per sq. in. working stress, the use of a steel with a minimum yield strength of 38,000 lb. per sq. in. Ordinary plain carbon plate with much lower yield strength was, of course, permitted, provided the thickness was increased to compensate for the lower yield point. The decreased thickness resulting from the use of high yield strength steel plate also resulted in appreciable savings in the amount of welding required.

Weight Saved With High Tensile Plate

In the boiler and pressure vessel field the higher operating pressures and temperatures of the vessels, requiring heavy plate of the usual carbon analysis with attendant difficulties in fabricating heavy plate, brought a demand for a high tensile plate. This was met by two new specifications of the A.S.T.M., also adopted by the A.S.M.E. Boiler Code, covering high tensile plate, 70,000 lb. per sq. in. minimum, made of modified carbon analysis. In the past year a large number of pressure vessels have been fabricated of this plate material with a weight reduction of approximately 20 per cent (Fig. 7). While only one of the low alloy high tensile steels has been officially adopted for pressure vessel construction, and that for riveted construction only, welded vessels have been made of high strength chromium-vanadium steel and others for low temperature service of 2½ per cent nickel steel.

Saving of 35 Per Cent

Numerous examples could be cited of weight savings in railroad cars resulting from the use of one or more high tensile steels (Fig. 8). In one lot of cars the use of welding in conjunction with the high tensile steels resulted in weight savings of approximately 35 per cent, and undoubtedly large tonnages of low alloy high strength steels will be used for freight and passenger car construction where saving in weight is an important economic factor.

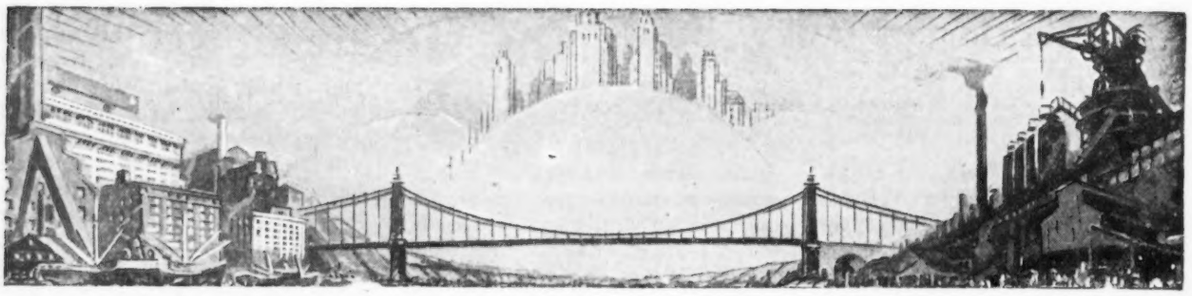
The majority of the low alloy high tensile steels previously enumerated have been developed for this purpose.

Practically all of these alloy steels may be successfully welded and used in the as-welded condition without further heat treatment, provided the sections are not too heavy to necessitate a stress relieving treatment, and provided the analysis is so balanced as to minimize weld hardening of the alloy steels. This is accomplished by holding the carbon content to a minimum where the total alloy content is relatively high. For structural purposes and operating at normal temperature under static loads, the electrodes used may be of normal plain carbon steel chemistry, since the deposited weld metal in the as-welded condition or after stress relieving at the usual temperatures, possesses a high yield point of approximately the same value as that of the alloy structural steel. In general, however, electrodes are available which will deposit weld metal of the same approximate composition for each of the alloy steels.

(TO BE CONCLUDED)

EFFECT OF $T^{max.}$ ON HARDNESS OF AIR-COOLED 4 TO 6 PER CENT CHROMIUM—½ PER CENT MOLYBDENUM STEEL

	Air Cooled From 1500 Deg. F.	Air Cooled From 1600 Deg. F.	Air-Cooled From 1700 Deg. F.	Air Cooled From Welding Temperature
0.23 per cent carbon	159 BHN	393 BHN	444 BHN	Approx. 450 BHN
0.12 per cent carbon	143 BHN	350 BHN	363 BHN	
0.05 per cent carbon	131 BHN	253 BHN	302 BHN	



Plant Expansion and Equipment Buying

Automotive Industry's 1936 Machine Tool Purchases May Top 1929 Sales

ENCOURAGED by more than the usual amount of optimism in the automotive industry, machine tool builders are already beginning to regard 1936 as a sell-out. Many large equipment orders are being quietly placed in the Detroit area, and sellers are becoming worried lest lengthening of deliveries will discourage the placing of additional orders with their companies. The principal reason for much of this buying is the probable radical change in body design on 1937 models.

Machine tool orders during the last week were in about the same volume as in previous weeks this year, and no outstanding lists were reported closed. The Firestone Tire & Rubber Co., Akron, Ohio, bought several tools. Builders are operating their plants at satisfactory levels and report a considerable shortage of skilled labor in some important centers.

NORTH ATLANTIC

Continental Can Co., 100 East Forty-second Street, New York, plans new one-story multi-unit plant on about 15 acre tract recently acquired at New Toronto, an industrial suburb of Toronto, Ont., including power house and other mechanical departments. Cost close to $500,000 with equipment.

International Nickel Co., 67 Wall Street, New York, has let general contract to Fraser-Brace Engineering Co., Ltd., 107 Craig Street, Montreal, for additions to plant at Copper Cliff, Ont., to include two new reverberatory furnaces, eight converters, pipe lines and auxiliary equipment. Cost over $5,000,000 with machinery. Project is scheduled for completion in about 12 months.

F. C. White, room 406, 82 Wall Street, New York, and Percy Groves, Brown Building, Philadelphia, are at head of project to construct a large coal and grain terminal at Huntington, W. Va., where negotiations are under way for lease of waterfront property from city, about 500 x 1000 ft. Project will include coal tipples for distribution and loading of river cargoes, to cost close to $250,000 with machinery, and grain elevator unit on adjoining site, to cost over $750,000 with conveying, elevating, screening and other machinery. It is proposed to organize company to construct terminal, of which Mr. White, noted, will be general manager.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 4 for 5000 pneumatic tool chisels for Brooklyn Navy Yard (Schedule 7057); until Feb. 7, three arc welding sets and spare parts for Brooklyn and San Diego yards (Schedule 7067), 10,500 ft. electric cable for Brooklyn and Mare Island yards (Schedule 7064).

General Motors Corpn., Broadway and Fifty-seventh Street, New York, has filed plans for new one-story automobile service, storage and distribution building, 198 x 282 ft., on Thirtieth Drive, Long Island City, to be erected in name of Aronaut Realty Corpn., a subsidiary. Cost about $75,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Commanding Officer, Watervliet Arsenal, Watervliet, N. Y., asks bids until Feb. 3 for one electric-operated pot-type hardening furnace (Circular 48).

Columbian Carbon Co., 45 East Forty-second Street, New York, has approved plans for new plant for production of carbon black near Dumas, Tex., comprising several units. Cost over $200,000 with compressors and other machinery.

Commanding Officer, Picatinny Arsenal, Dover, N. J., asks bids until Feb. 10 for 207 steel coil bodies (Circular 199).

National Oil Products Co., Essex and Daniel Streets, Harrison, N. J., manufacturer of special refined oil products, has arranged for purchase of part of former plant of Manufacturers' Can Co., on adjoining site, comprising two-story unit of about 50,000 sq. ft. floor space, and will remodel. J. H. Barton is vice-president of purchasing company.

Commanding Officer, Frankford Arsenal, Philadelphia, asks bids until Feb. 4 for blank and cup punch and die (Circular 305), one turret for 14-in. lathe (Circular 312); until Feb. 6, 50,000 rounds shotgun shells (Circular 258); until Feb. 10, 8485 high-test gray iron castings (Circular 306).

Reading School District, Eighth and Washington Streets, Reading, Pa., plans manual training department in new three-story junior high school, for which general contract has been let to Edward A. Reider, 1504 Alsace Road. Cost over $600,000.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 4 for 12 50-hp. electric motors and spare parts for Philadelphia Navy Yard; until Feb. 7, inclosed knife-type switches for Philadelphia and Brooklyn yards (Schedule 7087).

Curran Boiler Works, 501 Straight Street, Paterson, N. J., has been organized by Edward E. and John B. Curran and has established a shop at above address to construct boilers, tanks, vulcanizers, stacks and other steel plate products; also a repair department to handle all boiler repairs, including electric and acetylene welding.

WESTERN PA. DIST.

Hammermill Paper Co., Erie, Pa., plans extensions in No. 2 power plant, with installation of new 5000-kw. turbo-generator unit and accessories, two high-pressure boilers, pumps and other equipment. Cost over $100,000 with equipment. Stone & Webster Engineering Co., 49 Federal Street, Boston, is consulting engineer.

Westinghouse Electric & Mfg. Co., East Pittsburgh, plans four-story addition to enameling works at Mansfield, Ohio, primarily for storage and distribution, erection to begin in spring. Cost close to $100,000 with equipment. Other units will be built at same plant later.

Island Creek Coal Co., Holden, W. Va., has plans for new steel tipple at local coal-mining properties. Cost over $80,000 with equipment. Company headquarters are at 1 State Street, Boston.

NEW ENGLAND

Hygrade Sylvania Corpn., Boston and Bridge Streets, Salem, Mass., manufacturer of radio tubes, incandescent lamps and kindred products, has plans for new works in South Salem district, where about 27 acres has been acquired. It will be two and three stories, each unit 80 x 400 ft., with two two-story wings, 60 x 120 ft., and 60 x 80 ft. respectively. Entire structure will be used exclusively for radio tube manufacture; present such division will be removed to new location and increased capacity carried out, while existing plant will be continued entirely for production of incandescent lamps and parts. New works is scheduled for completion early in summer. Cost about $250,000 with machinery. Lockwood Greene Engineers, Inc., 40 Central Street, Boston, is architect and engineer. Walter E. Poor is vice-president in charge of engineering and manufacturing.

Casco Products Corpn., Railroad Avenue, Bridgeport, Conn., manufacturer of automotive parts and equipment, has let general contract to E. & F. Construction Co., 94 Wells Street, for one-story addition, 90 x 120 ft. Cost over $50,000 with equipment. Fletcher-Thompson, Inc., 1336 Fairfield Avenue, is architect and engineer.

Narragansett Brewing Co., Arlington Street, Providence, R. I., has let general contract for two-story addition, 60 x 60 ft., in conjunction with one-story unit, 65 x 240 ft., previously referred to in these columns, to Bowerman Brothers, Inc., 70 Bath Street. Last noted will be used for expansion in mechanical bottling works. Cost over $60,000 with equipment. E. M. Corbett, 49 Purchase Street, Fall River, Mass., is architect.

School Board, Nashua, N. H., plans manual training department in new three-story senior high school, for which bids will be asked on general contract early in February. Cost about $600,000. Wells, Hudson

DON'T TALK ABRASION-RESISTING STEEL TO ME

. . . I make my money on Replacements!

WELL! That's one way to look at it . . . but the fellow who must constantly be paying out perfectly good money for equipment replacements soon grows a bit exasperated. He knows that hi-manganese steels have been available, but the costs have always seemed entirely too high . . . and so he has suffered in silence and gone on paying for replacements of plain carbon steel.

However, Carnegie-Illinois Steel Corporation developed AR Steel . . . to meet the demand for a *low-price* abrasion-resisting steel. It has established some outstanding records, in fact one customer found that it stood up better than 11/14% manganese steel, white cast iron, rubber and other high cost materials that had been tried.

We suggest you send for our new bulletin on AR abrasion-resisting steel.

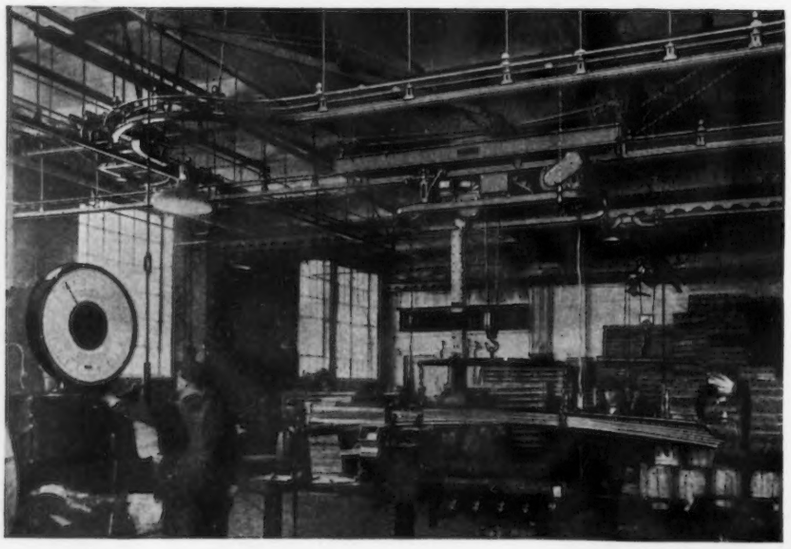
CARNEGIE-ILLINOIS STEEL CORPORATION - *Pittsburgh - Chicago*

Pacific Coast Representatives COLUMBIA STEEL COMPANY, San Francisco

Export Representatives: UNITED STATES STEEL PRODUCTS CO., New York

UNITED STATES STEEL

OVERHEAD MATERIALS HANDLING



HANDLING

Bar, Shaped or Tube stock and product—inexpensively, safely, and in tune with production requirements is one of the many services rendered by Cleveland Tramrail.

•

Consult your 'phone directory under Cleveland Tramrail.

Photo 1619 —

- **One ton loads are picked up at the car door: One man only required to transport the load to storage or direct to production machines.**

  Weighed enroute without rehandling on the Cleveland Tramrail Track Scales.

CLEVELAND TRAMRAIL

A DIVISION OF
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE OHIO

& Granger, Main Street, Hanover, N. H., are architects.

OHIO AND INDIANA

Century Machine Co., 4484 Marburg Avenue, Cincinnati, manufacturer of machinery and parts, has asked bids on general contract for one-story addition, 100 x 100 ft. Cost over $65,000 with equipment. Tietig & Lee, 34 West Sixth Street, are architects.

Owens-Illinois Can Co., Toledo, Ohio, has been organized as a subsidiary of Owens-Illinois Glass Co., 965 Wall Street, to operate a new branch of container business of parent company, covering tin and other metal cans and containers, packers' sanitary cans, etc. New organization has arranged for purchase of Enterprise Can Co., McKees Rocks, Pa., and Tin Decorating Co., Boston and Linwood Avenues, Baltimore, both manufacturers of metal containers. Properties will be taken over at once for initial production units of new company, with improvements and extensions in existing facilities. Company is also said to be planning early purchase of another can manufacturing plant on Pacific Coast.

Post Quartermaster, Fort Hayes, Columbus, Ohio, asks bids until Feb. 4 for one pumping unit for gasoline service (Circular 23).

Contracting Officer, Material Division, Air Corps, Wright Field, Dayton, Ohio, asks bids until Feb. 3 for 10 sets installation parts for adapters (Circular 503); until Feb. 4, three sets field lighting equipment (Circular 499), meters and transmitters (Circular 502); until Feb. 7, 63 drill presses (Circular 480), brace corners, angle supports, washers, etc. (Circular 512), 2600 adapter solderless-tube fittings (Circular 501); until Feb. 10, 200 flare-type rack assemblies (Circular 497), 566 wheel assemblies and 472 brake assemblies (Circular 495); until Feb. 11, distribution transformers and remote-control oil switches (Circular 496).

Chapman Price Steel Co., 3000 Shelby Street, Indianapolis, has approved plans for expansion and improvement, including one-story addition, about 20,000 sq. ft. floor space. New equipment will be installed in fabricating and galvanizing departments, as well as other divisions of mill. Cost about $500,000 with machinery. Company is a subsidiary of Continental Steel Corpn., Kokomo, Ind., which recently arranged financing in sum of $1,000,000 to provide in part for program noted.

Sinclair Refining Co., East Chicago, Ind., plans extensions and improvements in local oil refinery. Cost close to $100,000 with equipment. Work will be carried out in spring. Company headquarters are at 630 Fifth Avenue, New York.

Albra Castings Corpn., Huntington, Ind., recently organized, is operating a foundry for production of aluminum, brass, bronze, monel and other non-ferrous castings. Herman Voges, Jr., is president; V. W. Pacula, vice-president; Charles L. Terrel, treasurer, and S. B. Richey, secretary.

SOUTH ATLANTIC

Fort Pierce Growers' Association, Fort Pierce, Fla., affiliated with Florida Citrus Exchange, Jacksonville, Fla., has acquired waterfront property as site for new one-story citrus fruit-packing plant, to include conveying, loading and other mechanical-handling equipment. Cost close to $100,000 with machinery.

Seydel Woolley Co., 748 Rice Street, N. W., Atlanta, Ga., manufacturer of industrial chemicals, has plans for one-story addition. Cost over $30,000 with equipment. Oliver J. Vinour, 1283 North Morningside Drive, N. E., is architect.

Florida Power Corpn., St. Petersburg, Fla., plans extensions in transmission and distributing lines for rural electrification in Columbia, Pasco, Marion, Pinellas and other communities, totaling about 180 miles of lines, with power substation and service facilities. Cost close to $160,000. Financing is being arranged through Federal aid.

City Council, Greenwood, S. C., plans new municipal airport on 36-acre tract, with hangar, reconditioning and repair shop, and other field structures. Fund of $50,000 has been arranged through Federal aid.

SOUTH CENTRAL

Falls City Brewing Co., Thirty-first Street and Broadway, Louisville, has let general contract to J. F. Russell Co., 3908 Frankfort Avenue, for four-story addition for storage and distribution. Cost close to $100,000 with tanks and other equipment. Walter C. Wagner, Breslin Building, is architect and engineer.

Director of Purchases, Tennessee Valley Authority, Knoxville, Tenn., asks bids until Feb. 4 for Diesel or Hesselman crawler type tractors for Chicamauga dam; until Feb. 5, 14 and 16-in. electric-operated vertical centrifugal pumps for Guntersville and Chicamauga dams; Diesel engine-driven portable air compressors, capacity 300 ft. per min., for Chicamauga dam; until Feb. 3, four to eight flush deck-type steel barges, 26 x 110 ft., and one steel ferry barge, 26 x 70 ft., for Guntersville and Chicamauga dams.

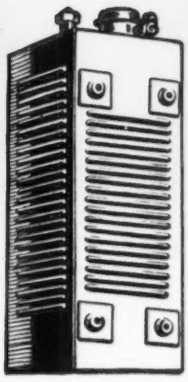
Choctaw Culvert & Machinery Co., Memphis, Tenn., manufacturer of metal culverts and kindred metal goods, will take bids at once for rebuilding plant recently destroyed by fire. Cost over $30,000 with equipment.

United States Engineer Office, Vicksburg, Miss., asks bids until Feb. 3 for one duplex fuel oil steam pump (Circular 178); until Feb. 18, angle valves, horizontal check

Costly

DELAYS AVOIDED!

low cost – a result of steel construction



THE EDISON is the only Storage Battery of American manufacture which is built of steel. Its electrolyte is alkaline, a steel preservative. All other storage batteries are lead-and-acid.

WHENEVER you consider the cost of an industrial storage battery it is well also to consider the devastating cost of delays – whether it be men, machinery, materials or all three! Storage battery failure in an industrial truck can cost many times the value of the battery itself.

It is a recognized fact that Edison Batteries are not subject to sudden failure. No one ever challenges the greater dependability of the battery that is built of steel – and which employs an alkaline preservative of steel as electrolyte. An Edison keeps things moving.

And, as to its own cost, 2 to 5 times longer life and less maintenance combine to make it the most economical of batteries. Men who know steel know this... but are you sure about your own company's batteries?

[Illustration shows use of Edison-powered truck in Alleghany's mills at Brackenridge.]

EDISON STORAGE BATTERY

DIVISION OF THOMAS A. EDISON, INC., WEST ORANGE, NEW JERSEY

The NEW WELDIT MODEL A Automatic
WELDING TORCH
with GASAVER in Handle

SAVES FUEL...
...CUTS COST

Thumb controlled Gasaver in handle cuts welding flame to pilot light size instantly when torch is not in actual use. Savings not affected by hose length. No re-lighting, no re-adjusting. Safe and simple to operate.

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valves and globe valves (Circular 175); until Feb. 17, 75,000 lb. steel plates (Circular 173).

WASHINGTON DIST.

Purchasing Officer, Department of Interior, Washington, asks bids until Feb. 5 for piston ring clamps, piston ring compressor, valve grinder, ridge reamers, king bolt reamers, valve spring lifter tools, clutch pilot tools, wrenches, bolt clippers, screwdrivers, pneumatic riveting hammer, welding outfit, gasoline blow torch, lubricating grease gun, gear pullers and other tools (Proposed 1177).

Purchasing and Contracting Officer, Holabird Quartermaster Depot, Baltimore, asks bids until Feb. 10 for 10 40-gal. foam chemical engines (Circular 91); until Feb. 13, one air compressor and one rotary lift (Circular 92).

Chemical & Pigment Co., Inc., 6401 St. Helena Avenue, Baltimore, has let general contract to Price Construction Co., Maryland Trust Building, for one-story addition, 105 x 280 ft. Cost over $45,000 with equipment.

Chemical Warfare Service, Edgewood Arsenal, Md., asks bids until Feb. 3 for 6 in. corporation pipe, tees, bends, etc. (Circular 35); until Feb. 13, copper angle tubes in lots of 5000 to 12,500 (Circular 37).

General Purchasing Officer, Panama Canal, Washington, asks bids until Feb. 5 for one slush pump and spare parts, 12,000 ft. steel wire cloth, 16,000 ft. galvanized steel wire poultry netting, 6000 ft. copper wire cloth, 20,000 ft. telephone cable, 2000 lb. steel welding electrodes, wire rope clips, galvanized steel eye bolts, galvanized steel ring bolts, forged steel turnbuckles and other supplies (Schedule 3120).

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 4 for one semi-automatic thread milling machine (Schedule 7089), two hand screw machines (Schedule 7082), all motor driven, for Newport, R. I., Navy Yard; steel rivets and washers (Schedule 7047), steel valves (Schedule 7045), brass, bronze, copper and iron or steel wire cloth (Schedule 7037), steel bolts and nuts and lag screws (Schedule 7032); until Feb. 7, steel rivets and washers (Schedule 7046), one radial drilling and tapping machine (Schedule 7069) for Eastern and Western yards.

BUFFALO DISTRICT

Rome Cable Corpn., Rome, N. Y., has been organized with capital of $1,000,000 to manufacture copper wire and cables, and wire specialties for electrical service, and plans operation of local plant. New company is headed by H. T. Dyett, C. A. Scott and H. W. Barnard, all of Rome and former officials of Rome Wire Co., merged several years ago with General Cable Corpn., New York.

Union Free School District No. 2, Marcellus, N. Y., plans manual training department in new two-story school, for which bids will be asked on general contract early in February. Cost close to $500,000. Financing has been arranged through Federal aid. C. W. Clark, 27 North Main Street, Cortland, N. Y., is architect.

New York Central Electric Corpn., Hornell, N. Y., plans extensions in transmission and distributing lines for rural electrification in districts near city, including power substation and service facilities. Cost over $65,000.

SOUTHWEST

Falstaff Brewing Corpn., 3684 Forest Park Boulevard, St. Louis, plans extensions and improvements in former plant of Krug Brewing Co., Omaha, Neb., recently acquired for branch plant, including equipment to increase capacity; mechanical-bottling machinery and auxiliary equipment will be installed to double present capacity. Cost about $100,000 with equipment.

City Council, Washington, Kan., has plans for new municipal electric light and power plant, using Diesel engine-generator units. Cost about $100,000. E. T. Archer & Co., New England Building, Kansas City, Mo., are consulting engineers.

Common Council, Mooreland, Okla., will begin work soon on new municipal power plant. Cost about $35,000. Benham Engineering Co., Perrine Building, Oklahoma City, Okla., is consulting engineer.

United States Engineer Office, Tucumcari, N. M., asks bids until Feb. 10 for two to five gas engine-generators and accessory equipment, and for one to three air compressors (Circular 126).

Board of Education, Charlotte, Tex., has authorized new one-story vocational training shop in connection with additions to high school, for which general contract has just been let to J. M. Dickey Co., San Antonio, Tex. Cost over $100,000. Morris, Noonan & Wilson, Builders' Exchange Building, San Antonio, are architects.

MICHIGAN DISTRICT

Chevrolet Motor Co., 3044 West Grand Boulevard, Detroit, has asked bids on general contract for addition and improvements to power plant on East Euclid Avenue and installation of new equipment. Cost over $50,000 with equipment. Albert Kahn, Inc., New Center Building, is architect and engineer.

Rademaker Chemical Corpn., Manistee, Mich., producer of liquid bromine and kindred industrial chemical products, plans expansion and improvements, including new equipment, drilling of new wells and other extensions. Cost about $75,000 with equipment.

Board of Education, 1354 Broadway, Detroit, plans manual training department in new three-story Western high school, for which general contract was recently let to Rozyski Brothers Co., 1950 East Canfield Street. Cost about $1,0000,000. Financing has been arranged through Federal aid.

City Council, Dowagiac, Mich., plans extensions and betterments in municipal electric light and power plant, including additional equipment. Fund of $200,000 has been arranged.

Tivoli Brewing Co., 10129 Mack Avenue, Detroit, has let general contract to Martin Krausmann Co., 955 East Jefferson Street, for addition for storage and distribution. Cost about $50,000 with equipment. Mildner & Eisen, Hammond Building, are architects.

MIDDLE WEST

Eddy Iron Foundry Co., 373 Grand Avenue, Chicago, has let general contract to Paul R. Jensen, 4929 Medill Avenue, for one-story foundry, 68 x 80 ft. F. H. Nordlie is company architect.

International Harvester Co., 606 South Michigan Avenue, Chicago, has filed plans for one-story addition to plant at 2600 West Thirty-first Street, 41 x 120 ft. Cost over $50,000 with equipment. O. A. Krueger is company engineer.

Schmidt Brewing Co., Dubuque, Iowa, will soon take bids for one-story addition, primarily for storage and distribution. Cost close to $45,000 with equipment.

United States Engineer Office, Omaha, Neb., asks bids until Feb. 5 for two steel pontoons, 16 x 32 ft., and 3½ ft. diameter (Circular 324).

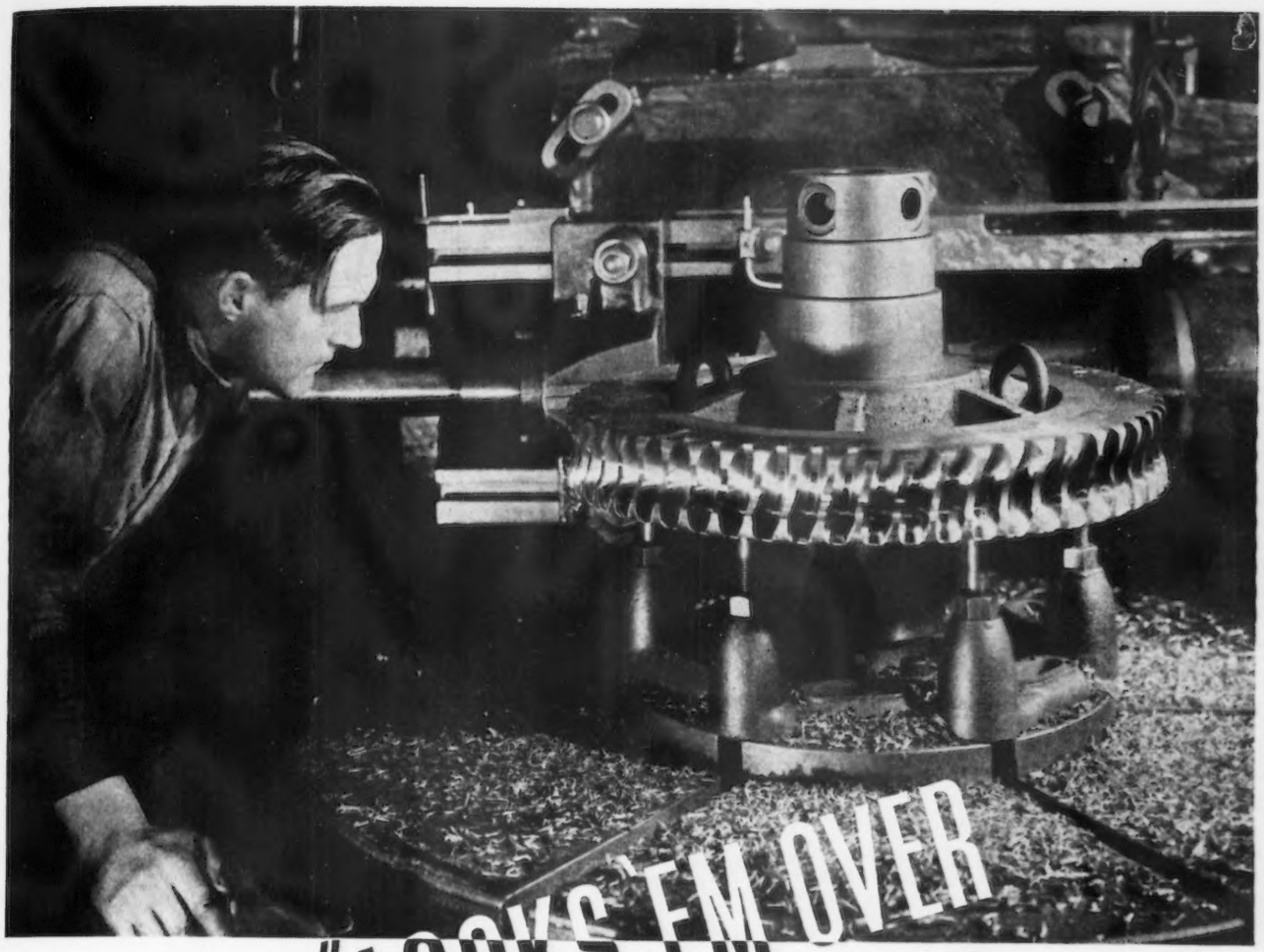
Metropolitan Utilities District, Eighteenth and Harney Street, Omaha, Neb., plans extensions in waterworks pumping station, with new pumping machinery and auxiliary equipment. Fund of $35,000 has been arranged.

Sherwin-Williams Co., East 115th Street and Cottage Grove Avenue, Chicago, manufacturer of paints, varnishes, oils, etc., has let general contract to Lundoff-Bicknell Co., 100 North La Salle Street, for one-story plant, 80 x 178 ft., at 548-56 East Kensington Avenue. Cost about $100,000 with equipment. Lester A. Abel, 100 North La Salle Street, is architect.

City Council, Minot, N. D., Jay W. Bliss, city manager, has plans under advisement for new municipal electric light and power plant, with steam division designed to burn lignite as fuel. Installation will include three generating units and accessories, boilers, pumps, water softener and other equipment. Cost about $600,000. Lloyd G. Wilhelm is city engineer.

PACIFIC COAST

Douglas Aircraft Co., 3300 Ocean Park Boulevard, Santa Monica, Cal., has let general contract to Bethlehem Steel Co., Los Angeles, for new hangar at aircraft works, 285 x 300 ft., and 90 ft. high, with shops and reconditioning facilities. Cost about $150,000 with equipment. Edward C. and Ellis W. Taylor, 803 West Third Street,



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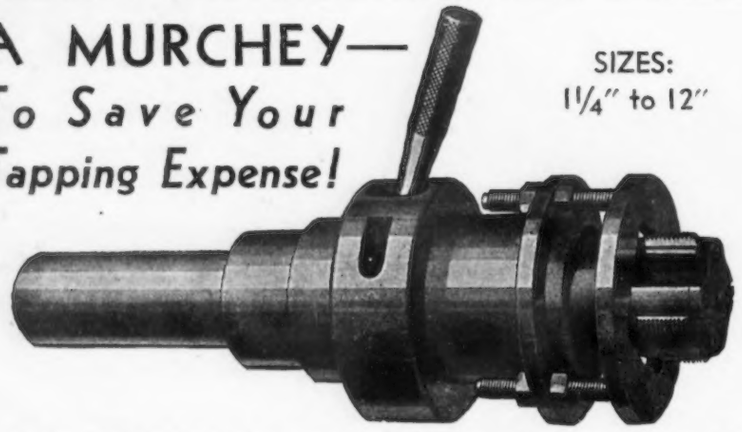

If you are using solid taps you have a profitable opportunity to reduce your tapping costs with the new Murchey Collapsible Tap.

You can perhaps visualize the time saved by this tap over your solid taps, and the following features assure you of high production free from tap troubles:

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Los Angeles, are architect and engineer respectively.

Board of Education, Bakersfield, Cal., has asked bids on general contract for new one-story mechanical shop, equipment storage and distributing building and garage unit. Cost about $55,000 with equipment. Ira W. Hoover and William C. Hays, Haberfelde Building, are architects.

American Fruit Growers, 1206 Maple Avenue, Los Angeles, have plans for one-story and basement addition to citrus fruit-packing plant at San Juan Capistrano, Cal., 50 x 210 ft. Cost over $40,000 with mechanical-handling equipment. C. E. Noerenberg, Los Angeles Railway Building, Los Angeles, is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Feb. 4 for six refrigerating plants and spare parts (Schedule 7048), motor-generator units and spare parts, frequency control units and other equipment (Schedule 7036) for Mare Island and Portsmouth navy yards; until Feb. 14, aluminum alloy ladder treads (Schedule 7086) for Mare Island yard; until Feb. 7, motor-driven engine lathe (Schedule 7065) for San Diego Naval Station.

Independence Canning Co., Independence, Ore., recently organized by Earl W. Scribner, Independence, and associates, has closed negotiations with city for local site for one-story food products canning plant, with steam power house adjoining. Cost close to $35,000 with equipment.

Continental Can Co., Orchard Street, Seattle, plans new two-story plant unit, 66 x 143 ft., primarily for forge shop, with part used for mechanical pattern works. Cost over $75,000 with equipment. Austin Co., Dexter-Horton Building, is architect and engineer.

Board of Education, 1151 South Broadway, Los Angeles, has engaged Albert C. Martin, Higgins Building, architect, to prepare plans for new one-story vocational training shop at John H. Francis polytechnic high school, 400 East Washington Street. Cost about $60,000 with equipment.

Del Rio Winery, Woodbridge, Cal., care of Carroll Skinner, Woodbridge, recently organized, has acquired about 10 acres for new cooperative winery, consisting of several one story units, with storage and distributing buildings. Cost over $60,000 with machinery.

Fentron Steel Works, Seattle, has leased new one-story building, 52 x 120 ft., to be erected by L. & R. Investors, Inc., Seattle, at 1401-9 West Garfield Street, for new plant. J. S. Harding, 2227 Tenth Avenue North, is general contractor.

Board of Education, Santa Monica, Cal., plans one-story addition to vocational shop at high school, in connection with other extensions and improvements. Shop will cost about $40,000 with equipment. Entire project will cost $450,000. Financing has been arranged through Federal aid. Marsh, Smith & Powell, Architects' Building, Los Angeles, are architects.

◀ FOREIGN ▶

British Marine Aircraft Co., Ltd., London, England, recently organized by interests connected with Cables & Wireless, Ltd., London, and others, has acquired about 120 acres near Southampton, England, for new plant for manufacture of flying boats of Sikorsky type. Works will comprise group of one-story units for parts production and assembling, with power house and other mechanical departments. Cost over $350,000 with equipment. Company has arranged for stock issue of 780,000 shares, part of fund to be used for purpose noted. Sir Frederick Higgins, Air Marshal, will be chairman of new company.

Korean Nitrogenous Fertilizer Co., Eian, Kankyo-Hokudo, Korea, has approved plans for additions for liquefaction of coal, comprising several units for converting coal under carbonization process into oils, gasoline, paraffin, etc. Plant has present coal-treating capacity of 100,000 tons a year and this will be doubled. Cost over $650,000 with machinery.

Thames Board Mills, Ltd., Warrington, Lancashire, England, manufacturer of paperboard products, etc., plans erection of new plant on 30 acre tract, to include power house, machine shop and other mechanical departments. Cost close to $1,000,000 with equipment.

Ault & Wiborg, Ltd., Standew Road, S. W., London, England, manufacturer of printing inks, has plans for one and multi-story addition. Cost close to $450,000 with machinery. Gunton & Gunton, Empire House, St. Martins le Grand, London, are architects and engineers. Company is affiliated with Ault & Wiborg Corpn., Cincinnati.

City Council, Winnipeg, Man., has authorized extensions and improvements in municipal hydroelectric power plant at Slave Falls, with installation of new 12,500-hp. water turbine-generator unit and auxiliary equipment. Extensions will also be made in transmission lines. Cost over $400,000.

Gigantic Is the Word

(CONCLUDED FROM PAGE 31)

the lift required to raise a modern railroad locomotive weighing 150 tons. This lifting force of 300,000 lb. is applied by the large hoist motors plus the movable counterweight. The principle applied is comparable with that of a modern office building elevator and consists of substituting for part of the machine's stationary counterweight a live counterweight that moves up and down as the dipper moves and thus greatly increases both the digging force and speed of operation.

Thirty General Electric motors, capable of developing a total of 2500 hp. supply the power for all the operations of this giant stripping shovel. It is driven and controlled by two men and crawls on four independently-driven, caterpillar-type mountings.

The single operator of this machine's digging and stripping maneuvers controls the digging motions of this big stripper with no more difficulty than if he were operating the smaller electric coal-loading shovel which works almost in the shadow of his machine.

The 300-ton-per-hour capacity tipple was designed, manufactured and erected by the McNally-Pittsburgh Mfg. Corpn. The tipple is of all-steel construction, loading on five tracks, with picking tables and loading booms over four tracks. The shaking screens are in two separate operating sections, the slower operating screen or main shaker screen removing the 3-in. and 6-in. sizes from the run-of-mine and the high-speed Parrish type screen making the operations in the 3-in.-minus product.

A scraper-type mixing conveyor is used to cross the ends of all the loading booms for selective mixing of any or all sizes, and in the slack track end of this mixing conveyor a McNally-Pittsburgh 36 in. x 54 in. single-roll crusher is interposed and with the mixing conveyor carrying on both top and bottom runs, selective crushing of any size of coal is possible. The crushed product may be delivered either to the bottom run of the mixing conveyor for delivery to any desired track, or may be delivered by scraper conveyor to a vibrating screen for removing any 1¼-in.-plus for return to the main shaker screens.